DEC 24 1926

See Yellow Section for Contents, Market Review

IRON TRADE REVIEW

Registered U. S. Patent Office

Published Weekly
VOL. LXXIX No. 26

CLEVELAND, O., DECEMBER 23, 1926

Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

Six Dollars a Year
Single Copy 25 Cents

They O.K. Wilson Machines

3 Years' Satisfaction

We have had a Wilson Arc Welder in operation here at our factory for approximately three years, and it has given us the best of satisfaction.

Crossley Machine Co. Inc.

A Good Investment

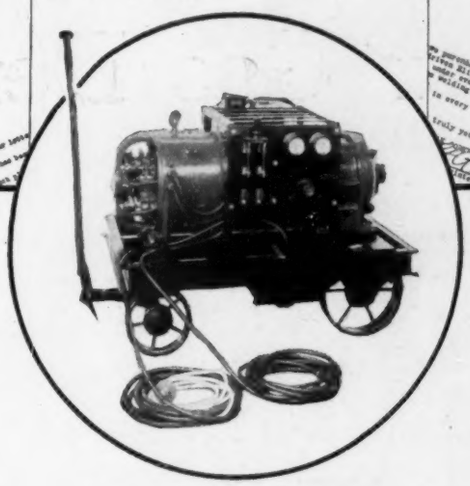
The Wilson Plastic Arc Electric Welding Machine purchased from you some time ago has given us satisfaction and we consider the investment a good one.

Imperial Oil Refineries, Limited

Wide Range — Close Control

We have had a portable Wilson Electric Arc Welding Machine about two years. This is a splendid machine and has given thoroughly satisfactory results. On account of the wide range and close control obtainable, we have found it particularly valuable for welding cast iron.

Sun Shipbuilding & Dry Dock Co.



The above is a Wilson Type S Single-Operator Motor-Driven Electric Welding Machine — designed for both production and repair work, and adapted for use wherever power is available. Its capacity is 25 to 250 amperes. Other Type S Machines include both single and two-operator units — gasoline-engine-driven, belt-driven and motor-driven — portable and stationary. Capacities, 25 to 200, 25 to 250, and 25 to 500 amperes.

In Constant Use

Our Wilson Electric Arc Welder has been in constant use from eight to twelve hours per day since its purchase. We can recommend this machine very highly.

The Scranton Pump Company

10 Machines 6 Years Old

We have, as you know, many Wilson machines in practically constant use and ten of them over six years old. When we need a new machine you will hear the usual, "When can you ship?"

Hutton Welding Company

Bought Five More

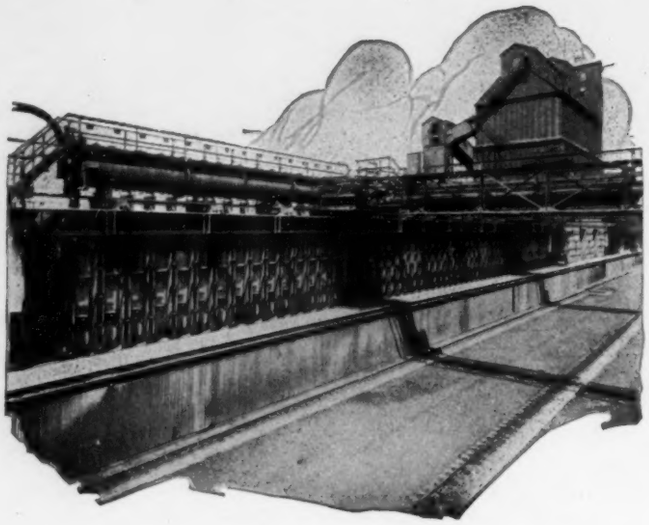
The original Wilson Welding Machine you sold us about four years ago is still in service. The fact that we have since purchased three additional motor generator sets and two gas-driven units should be proof enough of our satisfaction.

The Weldmech Company

WILSON WELDER & METALS CO. INC., WILSON BUILDING, HOBOKEN, N. J.

WILSON

WELDING MACHINES AND WELDING WIRE



Built-In Insurance Against Greater Gas Demand

When the inevitable increased demand for gas comes, the operator of Becker Type Combination Ovens is in a favored position, for the assurance of a future supply of over 60% more coke oven gas is built into the Becker Oven.

By substituting blast furnace gas or producer gas as oven fuel, this potential capacity becomes actual production.

The Iron and Steel Companies buy this insurance in their coke plants for it is one of the most fundamental properties of the Becker Oven. It is the more valuable because no company can say when and to what extent it will need more gas.

The Koppers Company

Pittsburgh, Penna.

Chicago, Ill. New York City

Fig. 1—Two units of six machines each compose the entire battery of centrifugal casting machines erected at the end of the new shop, adjacent to the cupola building

Casts Iron Pipe

In Spinning Green Sand Molds

Birmingham Establishment Introduces New Features in Pressure Pipe Plant—Plan Continuous Operation

By Dan M. Avey

SINCE the first ancient craftsman in metals found that by attaching his mold to a chain and whirling it about his head to force the molten contents to seek out the most intricate corners of the mold cavity, the idea of centrifugal force applied to casting problems has intrigued interest. The inertia effect which causes a rotating body to pull away from the center about which it is spinning has been applied in various ways to the art of founding. The idea itself is not new, but its practical application awaited the inventive genius of the present century. De Lavaud, a Brazilian, merits the credit for applying centrifugal force to make hollow cylindrical iron castings in this country and through him and his successors cast-iron pipe is made successfully in water-cooled metal molds revolved at high speed about a longitudinal axis.

Another name has been added to the roster of those who have applied this basic force in a commercial way to cast-iron pressure pipe. W. D. Moore, president, American Cast Iron Pipe Co., Birmingham, Ala., conceived the idea of setting this force to work, still retaining the effects of sand molds upon the physical characteristics of castings made therein. Mr. Moore has developed this idea and through his strength of purpose and engineering ability has built and put into operation the first commercial centrifugal cast-iron pipe plant using molds lined with green sand. Although he ascribes credit for development of this plant to his associates, the general layout and many of the detailed features are his own and should be so credited.

Preliminary training fitted Mr. Moore for the task that he has accomplished. While his preparation was not directly along the lines of foundry experience, it gave him a broader foundation of general knowledge which he has applied in an ingenious manner to the manufacture of centrifugal pipe cast in green sand molds for

The author is editor, *The Foundry*, Cleveland.

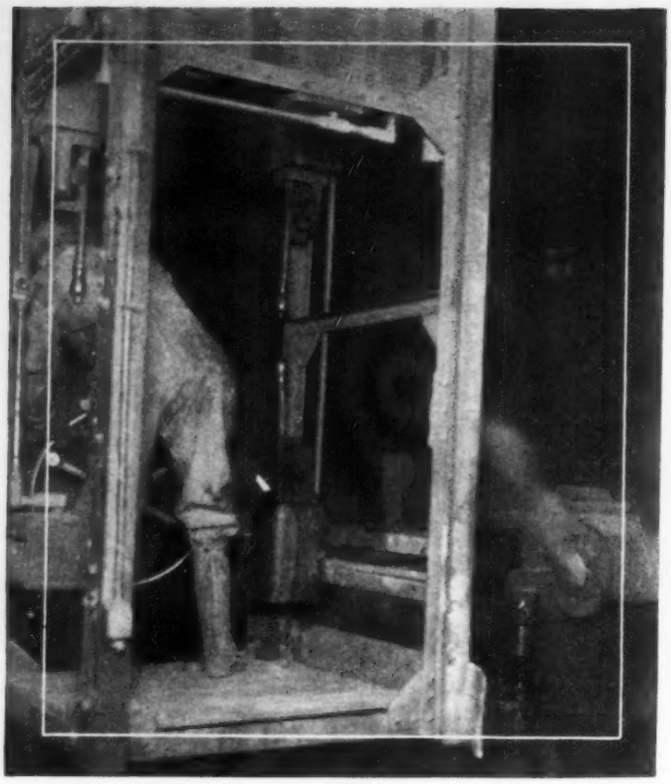


Fig. 2—Traveling monorail cranes carry the metal from the cupolas to the casting machines

the American company. In fact, he has worked many times exactly contrary to some of the previously accepted theories of foundry practice. In other instances he has adapted the best of foundry procedure to the engineering of this unusual plant.

The plant now is working double shift and shortly is expected to be placed in 24-hour continuous operation. The rapidity with which the plant has been built and placed in service may be gained from a remark by J. W. Moore, general manager, who says:

"On the 19th of October, 1925, we had just a desire for a plant and on July 1, 1926, we cast the first pipe."

Today, 12 casting machines, constituting two complete units are spinning the full 16 hours, producing their quota of 16-foot, cast-iron, bell and spigot, pressure pipe, while the towering double unit prepares and delivers the molding sand to two molding stations at each of which six pipe molds are made at the same time. One cupola of a battery of three supplies the metal and two shakeout or sand removal machines are employed supplementing the casting machines.

The present plant represents the culmination of a series of experiments on centrifugal castings which were started as early as 1917 and continued intermittently through 1922. At the latter date more intensive attention was given to the problem and during 1923, 1924, 1925 and through the present year approximately 20,000 tons of centrifugal pipe, cast in sand molds has been produced and placed in service. The pipe made in the early stages all was in 12-foot lengths.

As indicated from the accompanying drawing, the entire centrifugal casting shop is under one roof. Along one end of the building 12 casting machines are spaced in pairs. Over these machines two bridge type cranes are provided, serving to deliver and remove the flasks. Each serves a battery of six casting machines. Immediately at the right will be noted at *B* the two sand removal stations from which the pipe are taken inward to the center to be passed through a cooling oven. At *C* and *D* are the two molding stations, each accommodating six molds at a time in units of three. In the center and covering the space from *E* to *F* is the sand-handling system which extends beneath the floor level for a distance and then by one elevating stage to the right and two to the left to a central storage tank in a manner which will be explained. At *G* and *H* will be noted the dipping tanks where a coating of tar is applied to the finished pipe and *I* and *J* are the testing stations where pneumatic or hydraulic pressure, as desired, is available to test the pipe before final delivery to the storage yards *K*.

Split Into Batteries

The 12 casting machines are divided into two batteries, two 4-inch and four 6-inch units, and two each of the 8, 10 and 12-inch molds. The casting machines are readily interchangeable, and all may be adapted to take different size molds within a period of two to three hours. Casting machines, the heart of this system of making pipe are unique and perhaps should be described first to give an idea of the requirements about which this closely synchronized plant has been built.

Each machine consists essentially

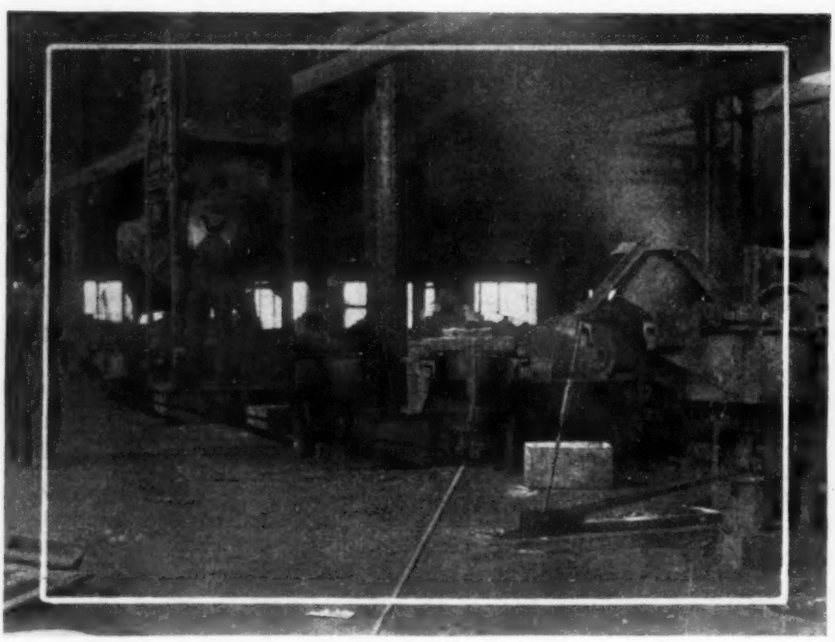


Fig. 3—As each of the pouring ladles is filled, the delivery ladle is moved along to the next machine

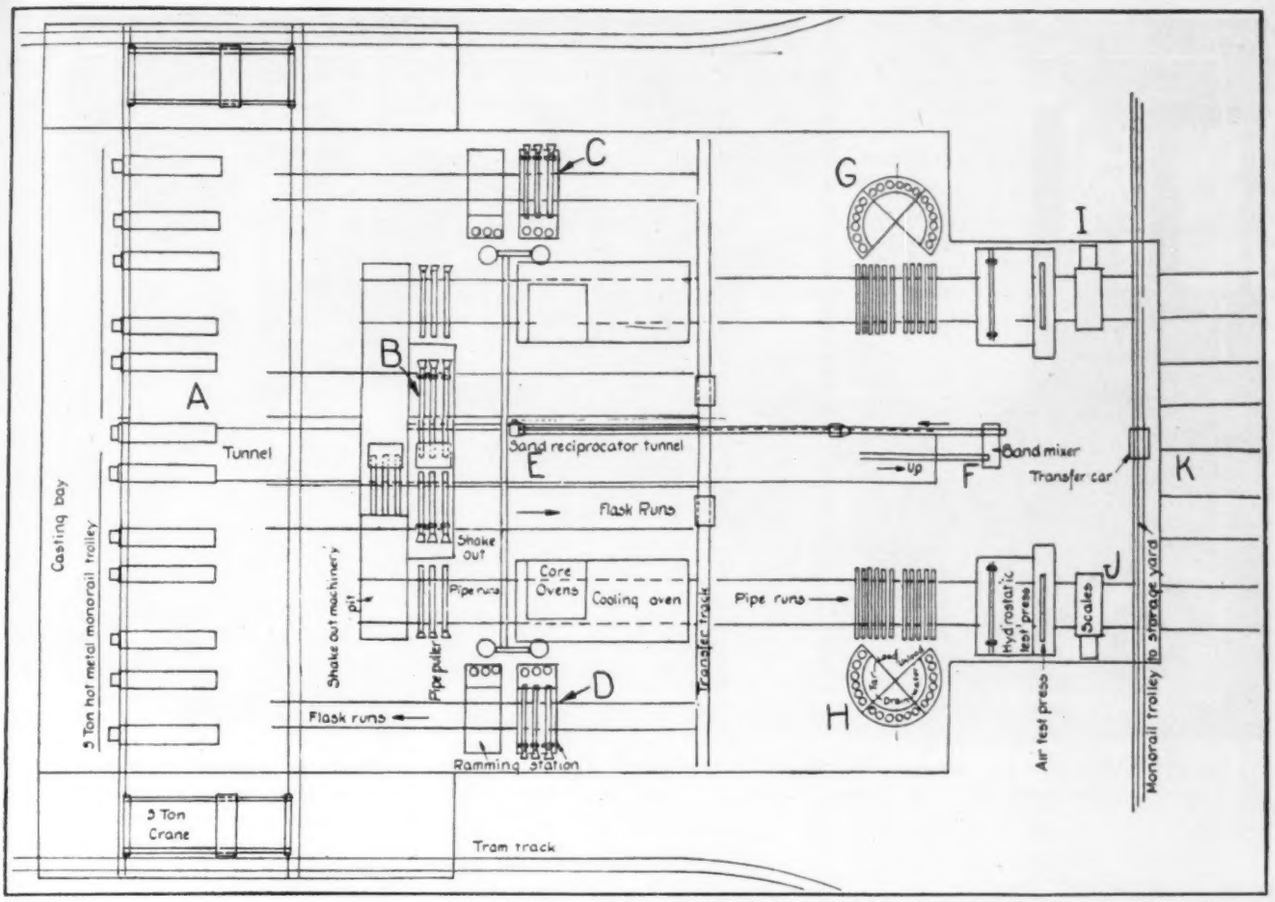


Fig. 4—The entire plant is housed under one roof. The casting machines occupy one end; the shakeout, cooling chambers, sand handling and molding are in the center, and the dipping and testing stations are placed in the opposite end

of an outer shell, within which a cylindrical flask, containing a sand mold for a pipe, is placed and rotated at sufficient speed to impell the molten metal, when admitted, to the outer wall, thus forming a pipe without the need for a central core. The lower portion of this shell, as it may be called, is in reality a heavy machine base, carrying at one end the motor for rotating the mold and at the other a carefully designed tilting pouring ladle. The base or lower half of the shell is hinged near the end carrying the drive motor and a hydraulic ram near the opposite end serves to elevate the pouring end until the shell, containing the mold, tilts downward toward the bell end at a slope of about ⅝-inch in 12 inches. The lower portion of the shell, or base, carries two sets of rollers or bearings, upon which the flask rests while rotating. Separate from the base, but within it is a lifting mechanism, which when the machine is open carries two cross arms, actuated by separate hydraulic plungers, that raise the mold off the bearings upon which it is rotated while the casting is in progress. The upper portion of the shell is a hood or cover, supported at the four corners by hydraulically operated columns that raise the hood when it becomes necessary to admit or remove the rolls.

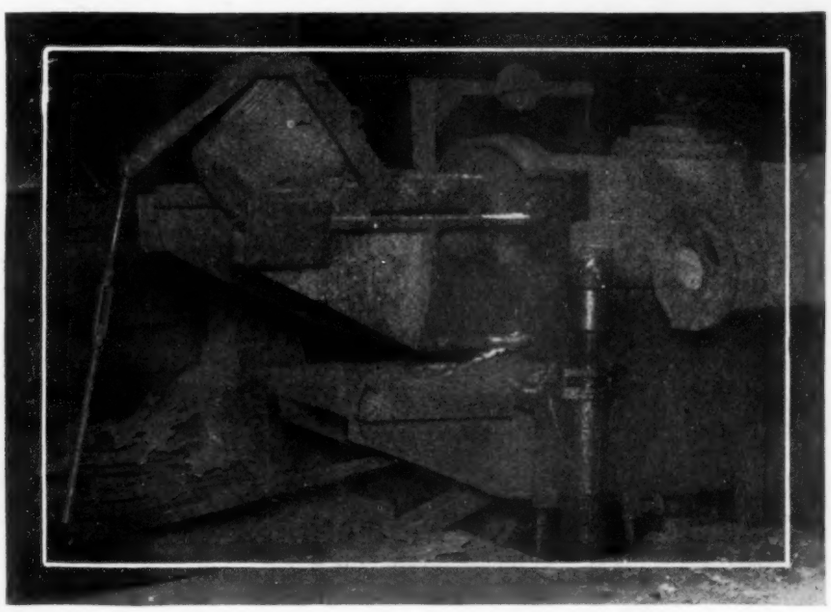


Fig. 5—The pouring ladle, containing the exact quantity of metal required, is tilted and pours its charge through a runner into the spigot end of the mold. Note the elevation of this end of the machine in pouring

Holds Flask Firmly

The hood has two sets of rollers or bearings, which when the machine is closed rest upon the flask, acting as idler bearings to hold the flask firm-

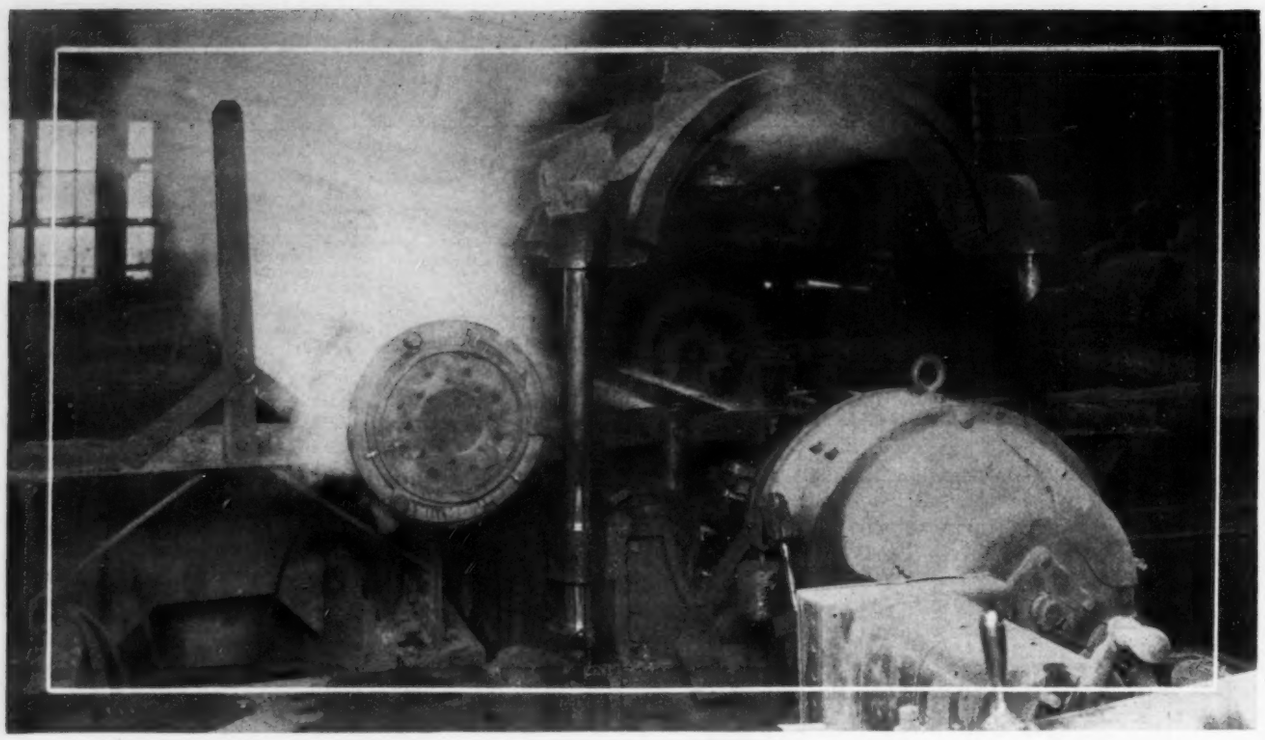


Fig. 6—After the pipe has solidified in the mold, the hood of the machine is lifted, the clamps connected to the drive motor are released and two T-head hydraulic pistons raise the flask and permit it to roll free from the machine. Note the steam, indicating the moisture in the sand mold

ly on the supporting bearings directly beneath.

Operation of the casting machine is simple, but effective. While in a level position, the hood is raised. A flask, containing a rammed sand mold, with a plate holding the bell core clamped by three wedges to one end, and a cover plate at the opposite end, is rolled in to rest upon the central cross arms raised to a height level with the delivery rails running at right angles to the machine. These cross arms then are lowered, so that the flask rests upon the lower pair of bearings. The coupling mechanism, on the drive motor then is affixed to the bell end of the mold, three hinged clamps engaging three slots in the edge of the enlarged flange on the belt end of the flask. The hood then is lowered so that the upper bearings hold the flask firmly. The flasks are machined accurately to center on suitable rings, which form an integral part of the flask and provide a bearing surface for the upper and lower bearings. These are given a dash of oil before the hood and upper bearings are lowered into place.

A predetermined and accurately measured quantity of iron then is placed in the ladle supported upon

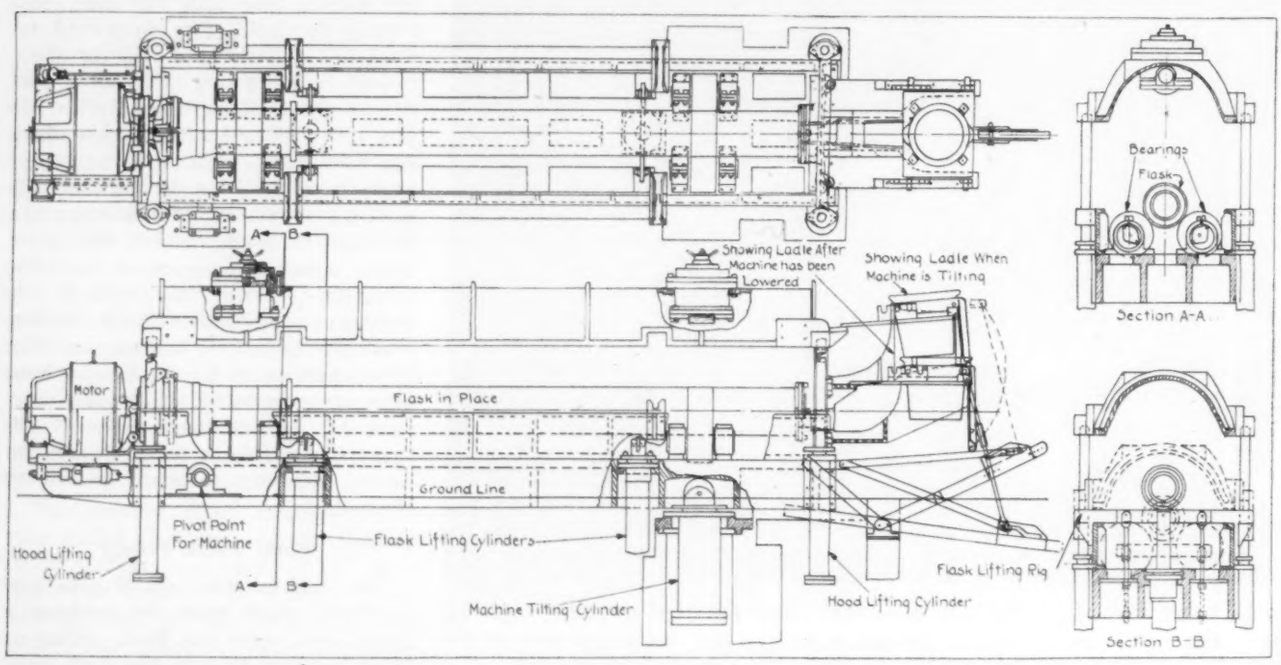


Fig. 7—General features of the casting machine, showing the method of introducing and removing the flasks

a weighing device, mounted on the end of the machine opposite the drive motor. An arm and sliding counterweight permits the delivery ladle to place just the amount of metal required in the pouring ladle to make the desired size pipe. A hinged arm then is attached to the outer edge of the pouring ladle supporting rig. The tilting ram, near the flask end of the machine then is set in motion, raising the end of the machine holding the pouring ladle. This tilts the pouring ladle allowing the molten metal to run through a runner into the spigot end of the mold and thence slowly toward the bell end of the mold.

Flask Starts Whirling

Simultaneously, the drive motor is set in motion, turning the flask slowly at just sufficient speed to prevent the entering metal from scouring the surface of the sand while at the same time, drying the inner surface of the mold. A uniform skin drying effect is achieved in this operation. Then, as the metal approaches the bell end, the machine is lowered to its level position and the speed of the motor is accelerated automatically and gradually to full casting speed. This speed is maintained until the metal has solidified.

Rotation then is stopped, the pouring ladle, which has remained tilted is returned to a level position, the tilting arms uncoupled and the entire pouring rig swung around at right angles to the machine to permit cleaning any encrusted metal remaining in the runner trough. The hood then is lifted, the motor drive mechanism quickly uncoupled and the flask, containing the pipe casting is lifted to a level with the receiving rails, which like the delivery table are at right angles with the machine. The flask is rolled out on this receiving table at the opposite side of the machine to that at which it entered and the cycle of operation is repeated.

Two Men to Three Machines

Two men attend and operate three machines. One at the pouring end cleans the runner trough, couples and uncouples the tilting levers which actuate the pouring ladles and assists in placing and removing the flasks. The other at the drive end of the machine handles the controls for all the hydraulic lifting and tilting mechanism, observes the timing of the various operations, attaches and removes the mechanism which couples the drive motor to the flask and sets the motor in motion to spin the mold.

Automatic equipment for regulating the speed of rotation has been provided. The time element in synchronizing the various sequence is so nicely adjusted that but little is left to human judgment.

When the operator has closed the machine by lowering the hood in place, he admits water to the tilting cylinder, thus raising the pouring end of the machine. No metal is admitted to the mold during the elevating operation. When the spigot end is in the full elevated position, the operating rod is inserted at the outer edge of the pouring ladle. Then as the machine lowers, the ladle automatically is tilted, accomplishing the pouring. The operator regulates the speed at which the machine is lowered to a level, thus determining the rate of admitting the metal.

The operations all are synchronized and all the operator has to do is regulate the hydraulic valve which sets the machine in motion from its elevation back to level. The rate of flow of the water out of the elevating cylinder controls the speed with which the machine resumes its level position. The electrical control is timed to throw the rotating motor to full speed as soon as the machine is back to horizontal. The speed of rotation advances from the slow speed of pouring to full high speed, when the metal is thrown to the outer face of the mold. Then the rate is reduced to about 25 per cent of the highest speed until the casting is solidified when the automatic control trips off and the flask comes to rest as the motor stops.

A revolution counter connected to the dead end of the motor shaft permits all speeds to be checked. The motor then is shut off and permitted to come to rest, the hood raised, the coupling removed and the flask raised

(*Concluded on Page* 1628)

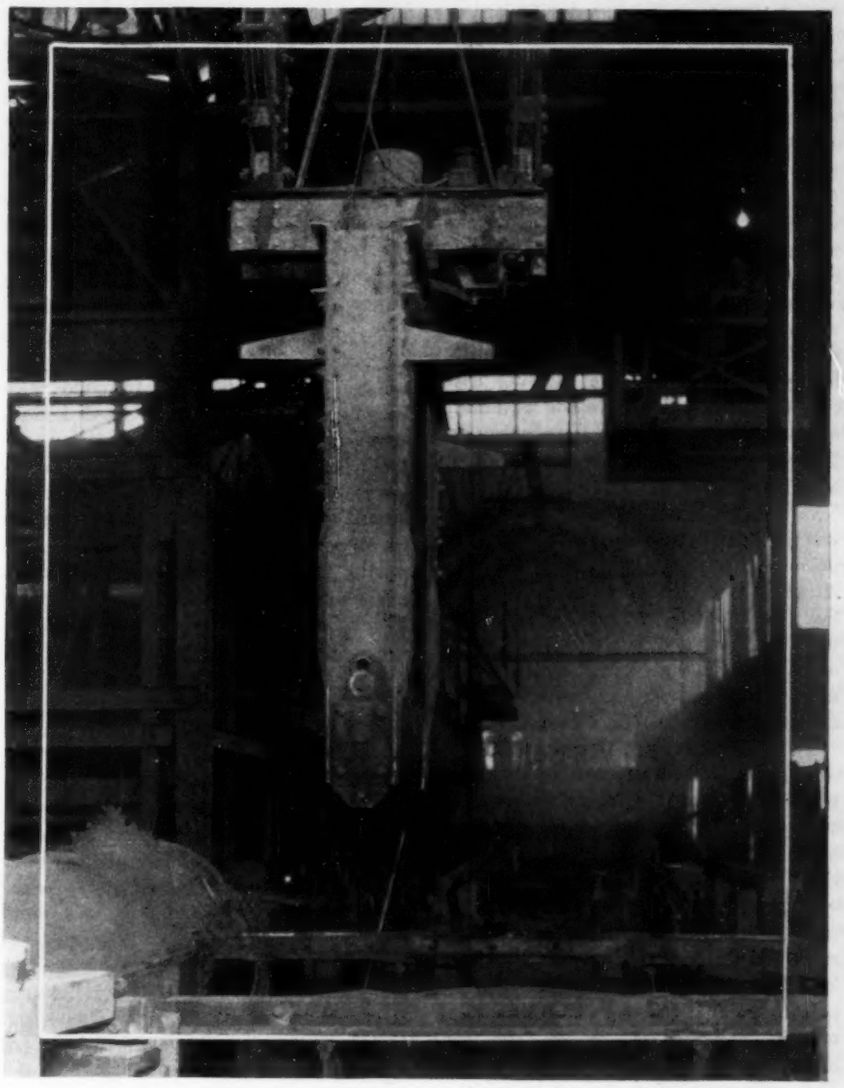


Fig. 8—A special lifting rig, operated entirely from the crane cab picks up and carries the flasks, delivering them to the machines, and returning them to the sand removal station

Lowers Cost of Metal Cutting

By Using Preheated Oxygen

Maximum Economy Is Obtained by Utilizing Cheaper Grade of Oxygen with Preheat—This Practice Facilitates Quick Starting, Eliminating Moisture Troubles and Hardening of Cut Face

By F. P. Wilson Jr.

PURITY of oxygen has been the subject of much discussion in the technical press and advertising pages of trade journals. There appear to be two schools of thought on this subject: One group believes that 1 per cent increase in purity from 98.5 per cent to 99.5 per cent means a difference of 40 per cent in cutting efficiency; the other group believes that in practice 98.5 per cent oxygen will do the same work for the same total cost as 99.5 per cent on metal of average thickness. This subject being of interest to the General Electric Co., a study was made extending over a period of eight months and the results of this investigation should be of interest to industry.

In making this study, the main objective has been an answer which will permit practical application. What, if any, will the saving be through the use of 99.5 per cent oxygen over 98.5 per cent oxygen in the shops using present equipment and methods, and what advantage would result from heating the cutting oxygen?

To obtain a proper perspective it will be essential to consider first the relative manufacturing costs of the two grades of oxygen, a factor which has not been mentioned hitherto. At this writing there are few if any commerical liquefaction plants in which 99.5 per cent oxygen can be made as cheaply as 98.5 per cent. The difference in cost varies with the type of plant, but a reasonable average is believed to be 15 per cent higher cost for the higher purity. The consumer may be offered either purity at the same price, but he or the manufacturer stands the increased cost. This factor imposes a handicap on 99.5 per cent oxygen not widely discussed up to this time. If it will do 40 per cent more work as claimed by some advocates, then the oxygen producers are losing 40 per cent of the business existing at the time 98.5 per cent was in use, and increasing production cost 15 per cent.

The trade has been educated to use and ask for 99.5 per cent oxygen. It is therefore not the purpose of this article to advocate the return of 98.5 per cent, but rather to present facts which should result in a realization among consumers that the economies they are obtaining in practice through the use of 99.5 per cent oxygen are far short of 40 per cent and also that the temperature of the cutting oxygen is worthy of more consideration than 1 per cent of nitrogen.

To detect any difference in relative efficiency of 98.5 and 99.5 per cent oxygen it is necessary to conduct a test in which the methods used deviate from actual practice to such an extent that the results cannot be accurately duplicated in all practical operations. There are so many factors involved in cutting that claims for purity must be general and must be properly subordinated to those items which are of greater importance.

Cost Versus Advantages

The entire problem is extremely complicated and is a study to determine the practical rather than the theoretical costs of performing a piece of work with either grade of oxygen. On this basis, any conclusions which exclude practical considerations have little value. Absolute purity of material is a worthy goal in any commercial enterprise, but the cost of producing higher quality must be compared to the gain through its use, and the loss through noneffective material because of wastage will of course be greater when using the more expensive product.

Misconception of the fundamentals of the cutting process by torch operators and their lack of realization of the costs involved result in the use of too high pressures, over-size tips and excessive preheating flames. The desire for speed has obscured completely the cost per inch cut. Until an improvement is made in the personal equation, the question of oxygen purity is premature.

The nature of the work greatly influences any costs and probably the only field where the maximum benefit of oxygen purity can be obtained is machine cutting work, a small part of the cutting industry. Even here the purity question is overshadowed by other factors, the control of which must be established before a purity discussion assumes economic importance.

Apparatus manufacturers must meet their responsibility for promoting the efficiency of the process and continue research toward the development of improved equipment. Until standards of design are given considerably more thought, it is futile to advocate high purity oxygen on the basis of any absolute percentage figures. Results obtained under one set of conditions with some particular torch might be reversed if another torch were substituted. The importance of apparatus design overshadows the question of a small quantity of nitrogen in the cutting oxygen.

Other variables for which allowances must be made before it is possible to guarantee an absolute economy figure for high purity oxygen are the fuel gases used, speed of cutting, kind of material cut, thickness of material, type of cut, moisture content of the oxygen, temperature of the metal being cut, and temperature of the oxygen. Any of the foregoing if changed would alter the results. To conduct a test and obtain an absolute answer which would take into consideration all the variables would be almost impossible; yet unless this is done, it is almost useless to predict any absolute figures purporting to show far reaching economies resulting from the general use of high purity oxygen.

One phase of the work which seems to have received little publicity is the temperature of the cutting oxygen. The burning of the iron is one function of the cutting jet. The second is to dislodge such weakened metal and blow it out of the cut. The chemical reaction in the cutting of steel is fundamentally the reaction between iron and oxygen to form iron oxide. The law of mass action and Vant Hoff's law of reaction acceleration apply.

The first law states that the effec-

From an article presented in the October issue of *General Electric Review*. The author is associated with General Electric Co., Schenectady, N. Y.

tiveness of concentration of interacting substances greatly determines the speed of chemical reaction. In this case the oxygen and steel are the interacting substances and the effectiveness of concentration is a measure of the number of oxygen molecules in contact with the surface of the burning steel in a given period of time. Theoretically, if nitrogen is present it interferes with this concentration and nitrogen molecules get in the way of the oxygen molecules. By the addition of heat to the cutting oxygen, these nitrogen molecules are more easily blown out of the way, thus increasing the effectiveness of concentration and increasing the speed of the cutting.

Vant Hoff's law of reaction acceleration states that a reaction velocity increases with temperature. By heating the cutting jet the benefit of this principle is obtained by a further increase in the speed of cutting for the same oxygen flow or the cut is made at the same speed with a reduced oxygen consumption.

The second function of the jet is mechanical and is the source of a large part of the oxygen waste. It is the reduction in the weight of oxygen used to produce this mechanical effect which superheating accomplishes. The heat applied before the oxygen leaves the cutting nozzle results in an expansion of the gas, thus permitting the same velocity of exit through the nozzle but greatly reducing the weight of oxygen lost in performing the mechanical work. A small quantity of nitrogen in the oxygen will in no way prove detrimental to the desired mechanical effect in blowing the weakened metal out of the cut.

Temperature Is Important

The question of oxygen temperature becomes extremely important during winter months when tanked oxygen is subjected to temperatures below zero in some sections of the country. The temperature of oxygen in tanks so exposed results in an increase of consumption which assumes serious proportions and is a source of considerable waste. The charts of tip sizes and pressures that are distributed by torch manufacturers do not take into account the temperature of the cutting oxygen and the result is wastage which varies in proportion to the drop in temperature.

A temperature of 200 degrees Cent. is obtained at a cost not worthy of computation, and yet the economy which it produces in the cutting oxygen reaches as much as 35 per cent. These savings become greater when the application is made to work involving high rates of oxygen flow. The high flow and considerable pressure drop from 2000-pound tanks produce cooling of the oxygen due to the internal energy of free expansion. The resulting low-temperature oxygen retards cutting and its increased density causes wastage of considerable economic importance.

Tests Were Standardized

Cuts were made on steel plates ranging from ½ to 12 inches in thickness. As a basis of comparison, a standard speed was established for each metal thickness and the oxygen required to produce equivalent cuts at this speed was measured. Flow meters especially calibrated for this work were used. The torch was mounted in a rigidly constructed cutting machine, eliminating the personal equation and assuring steady operation.

Equality of plate temperatures was attained by making cuts on test specimens 24 inches long by 3 inches wide. These specimens were cut from the same steel plate to insure equal chemical qualities. Each test cut was made on a new specimen; this procedure is far more satisfactory than attempting to cool the plates with water and eliminates variation in plate temperatures, an important factor in a test of this nature. The speeds and pressures were approximately those used by the General Electric Co. in the plate cutting shop and the results of these tests can be expressed immediately in terms of practice.

The flow of oxygen per hour for any given metal thickness will vary with different torches, pressures and speeds. It is extremely difficult to conduct a test of this kind and obtain absolute figures which can be applied generally, but relative or comparative data are obtainable for this purpose. It would be useless to try to make a general prediction of the oxygen flow that would be required to cut a given thickness of steel because there are too many variables. It is reasonable however to select a set of conditions such as pressures, speeds, equipment, etc., and determine the relative amount of the various grades of oxygen required to make a cut under these conditions. The relative consumption in terms of percentage could then be generally applied. Pressure is not absolutely reliable as a flow indicator and the usual method of endeavoring to show considerable advantage through the use of high purity oxygen by observing relative pressures is deceiving if not properly applied. The flow varies approximately as the absolute pressure ratio, not as the gauge pressure ratio.

In addition, tests of a nature which involve pressures only are objectionable because an increase in pressure means an increased flow which is in turn accompanied by a greater drop in temperature due to expansion. This temperature variable must be controlled, which further emphasizes the inaccuracy of tests based on pressure gage readings.

It is realized that the exact conditions of temperature and flow obtained in these tests could not be duplicated in general practice with all types of equipment, but the effect of temperequipment, but the effect of temperature for one set of conditions will be relatively the same for any other set of conditions. That is if the oxygen is raised to a temperature of 200 degrees Cent. in any torch at a point near the tip, the effect should be an approximate 35 per cent decrease in flow compared to the flow at a temperature of mines 18 degrees Cent., a temperature which is not excessively low for winter months.

This article does not dispute physical and chemical laws which in their application prove that iron will burn faster in pure oxygen, but it does endeavor to show how far this phenomenon can be applied in practice and measured in terms of actual economy with existing conditions. The difference is not in the principle, but the extent to which it applies.

Although there is some difference under test conditions in performance between 99.5 per cent oxygen and 98.5 per cent oxygen when nitrogen is the impurity, this difference becomes less as practical operating conditions deviate from those existing during the tests. However if 99.5 per cent oxygen can be obtained at the same cost as 98.5 per cent, it should be used for the same reason that a practical mathematical calculation is more accurate when carried to five decimal places instead of four.

Heating Gives Best Results

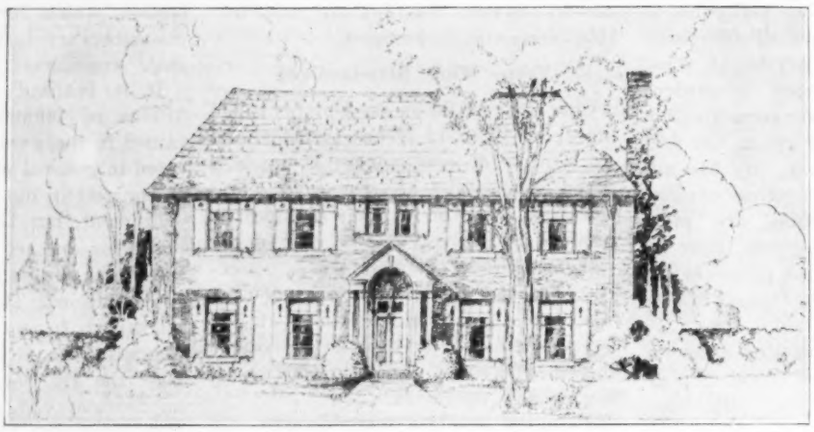
Greater economies can be effected in practice on metal up to 12 inches in thickness by increasing the temperature of the cutting oxygen than by increasing the purity from 98.5 to 99.5. Tests were not made on sections above 12 inches in thickness because the majority of cutting work is on smaller metal sections. Therefore, no statement is made of the effect on heavier metal sections.

The principle of heating the cutting oxygen can be applied safely in torches using city gas for cutting but we are not in a position to advocate it for torches in which acetylene is the fuel gas used.

Moisture in the cutting oxygen if

(*Concluded on Page* 1618)

The House of Tomorrow



Made Fireproof and Permanent by Steel

By Robert T. Mason

FIREPROOF homes! What a contribution to the progress of civilization. We have developed through the past decades many of the conveniences which contribute to the physical comforts of modern man. The factor of safety has been increased considerably through the change from wooden to steel railroad and street cars, the adoption of the all steel automobile body, fireproof office and industrial buildings and similar developments.

But the domestic dwelling has remained unchanged, fundamentally, wood, brick, mortar, plaster, slate and composition materials continuing the components of construction. All that man treasures, his family, his heirlooms, his domestic life, and personal valuables are no better protected now than years ago.

Realizing this, progressive merchandisers and a few manufacturers of steel products have been attempting to develop the use of steel in domestic dwelling construction, for increasing permanency and fireproof qualities.

Although home construction employing steel is not absolutely new, it usually is not associated with the beauties and attractiveness of high class dwellings. An example of the latter now building in Cleveland merits more than casual attention.

S. R. McKay, head of the McKay Fireproofing Co. and McKay Construction Co., Cleveland, and a construction engineer of long experience, entered the field of steel frame houses to solve a problem of permanence. Mr. McKay, who in the last few years has been constructing houses in the $50,000 to $75,000 class, built a home for himself of that type, using the customary wood, brick and mortar materials. In seven months, the joists in the second floor of his home had shrunk ⅜ of an inch, producing unsightly cracks in plastering and greatly increasing the fire hazards. He estimates that the cracks will reach ¾-inch before the wood becomes fully seasoned.

He used steel as the only absolutely rigid material for construction in the basement floor beams, eliminating shrinkage in the first floor, but was unable to prevent cracks in the second and third stories. To eliminate these latter he decided to construct homes with all-steel framework, an architects' perspective and progress views of the first such dwelling being pictured in the accompanying illustrations.

This house is to have a frontage of 46 feet and a depth of 41.7 feet with a double car garage attached in the rear. Seven large rooms will be contained in the house, for which Brooke & Burrows, Cleveland, are architects. The only wood contained is in the roof, flooring and windows. It is designed to sell at from $20,000 to $25,000. The range of price on steel houses would be similar to that of other types.

For the joists 7-inch steel beams are used and for the studs, 6-inch. These sections are manufactured by the Jones & Laughlin Steel Corp., Pittsburgh, and were designed especially for such light construction as domestic dwellings. By slight alterations in designs, standard structural sections could be used as advantageously, eliminating some of the angles and stampings required for the light shapes. The floor beams are placed four feet apart and are either bolted or riveted together, being braced by 1½ x 1½ or 2 x 2-inch angles. For the partitions and cross pieces on the walls, 1½ x 1½-inch angles are used. Ceiling supports are angles 1 x 1-inch in size. The angles also are bolted or riveted to the joists and studs. Welding also has been used satisfactorily in joining the beams and angles. Mr. McKay expects to use this type of fabrication on his next steel frame building. Linde Air Products Co., New York, is supplying the welding of angles on the building now under construction.

Wall angles are placed 2 feet 6 inches apart horizontally and ceiling angles the same distance. To the wall and ceiling angles are fitted sheathing manufactured by the United States Gypsum Co., Chicago. A special clamp, or locking strip, developed by Mr. McKay, for which he has patents pending, fastens the sheathing rigidly to the steel without use of nails, rivets or other products. The sheathing is manu-

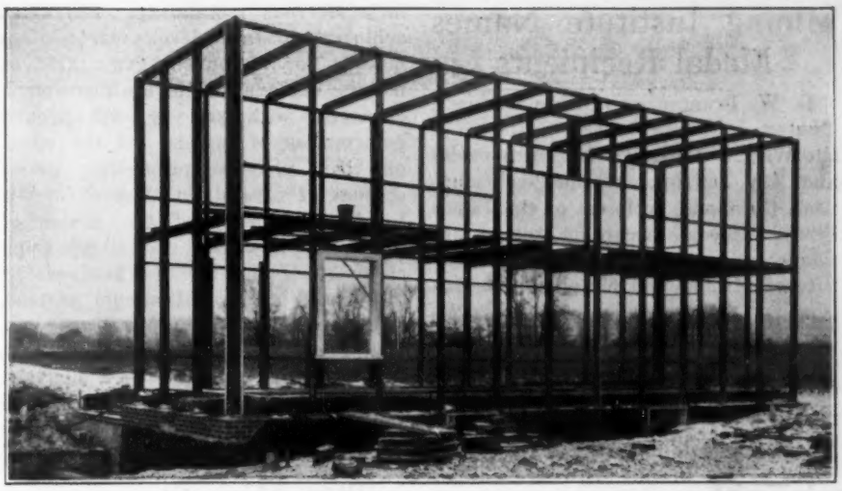
factured in 8-foot lengths and is then cut to 4-foot, fitting exactly the 4-foot spacing of the beams.

In the McKay constructed house, wood is employed for flooring. The usual 2 x 4 pieces are placed on the beams edgeways, 16 inches center, so that four inches clearance is obtained between the flooring and the beams. This allows plenty of space for plumbing and wiring without necessitating the drilling or burning of holes in beams which has been the customary practice where floors rest directly upon the supporting beams. It allows also the use of the knob and tube system of wiring instead of the more expensive conduit or cable type. The 2 x 4 pieces are fastened to the beams by spikes being driven into the wood and then bent into the flanges of the I-beams.

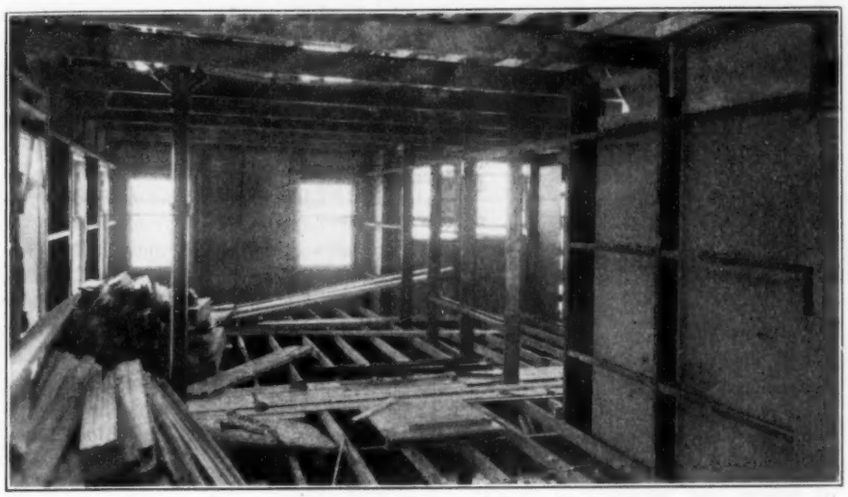
The special locking device for holding sheathing to the beams consists of metal strips cut from 26 gage galvanized sheets and bent to fit tightly over the flanges. The same locking device is used for either a gypsum or plaster board. A scratch or brown coat or white coat of plastering may be applied to the inside of steel I-beam studs, partitions and ceilings. On the outside walls, an asbestos furnace cement is applied to the horizontal cross angles and the boards then pressed and locked into the strips.

Inside walls are obtained by using a finished gypsum board. The finish work boards are 5 feet wide and from 4 to 12 feet long. These are interlocked into steel studs every four feet by the locking strip. The joints then are filled in and sized to receive wall paper or paint.

One of the favorable factors allowing the exact fitting of the inside wall boards is the trueness of steel. Warpage and shrinkage such as is encountered with wood are eliminated in the use of steel.



THIS STEEL SKELETON ILLUSTRATES THE SIMPLICITY OF ERECTION



AN INTERIOR VIEW SHOWING HOW FLOORS AND WALLS ARE JOINED TO THE STEEL FRAMEWORK

In this method of construction, costs are no greater than in use of wood, brick and plaster, and a resulting building of greater permanence is obtained. The light structural beams, used for the house cost $545, including I-beams for scaffolding which totaled $85. Angles, bolts, nuts, rivets and clamps were additional.

Erection costs for the structural framework totaled $252.40. This was for a 7-hour day, as the project is considerably removed from Cleveland city limits and the unions charge traveling time in that case. A foreman at $1.75 an hour and two workmen at $1.50 an hour each did the erecting. The plaster board used costs $32 per thousand feet in comparison with wood at $50 or more per thousand, which swells to about $70 or more when waste is counted.

One experience with this house which should favor further use of structural framework was the exact detailing involved. No holes had to be drilled on the job or beams cut to length. The fear of necessary fabrication on the job has hindered a

(*Concluded on Page* 1621)

WALLS AND ROOF WERE NEARING COMPLETION WITHIN THREE WEEKS FROM THE TIME THAT CONSTRUCTION WAS STARTED

Mining Institute Names Medal Recipients

D. W. Brunton, consulting engineer, Denver, has been named recipient of the William Lawrence Saunders medal and Zay Jeffries, metallurgical engineer, Cleveland, recipient of the James Douglas medal, according to an announcement of the American Institute of Mining and Metallurgical Engineers, under whose direction the awards are made. Presentation ceremonies will take place at the annual meeting of the institute in New York next February.

The Saunders medal, established in honor of one of the institute's former presidents and being awarded for the first time, goes to Mr. Brunton for development and exposition of the principles and practice of ore sampling; for systematic daily mapping of mine geology; for the Brunton mining compass; and for engineering achievements in connection with modern high-speed tunnel driving.

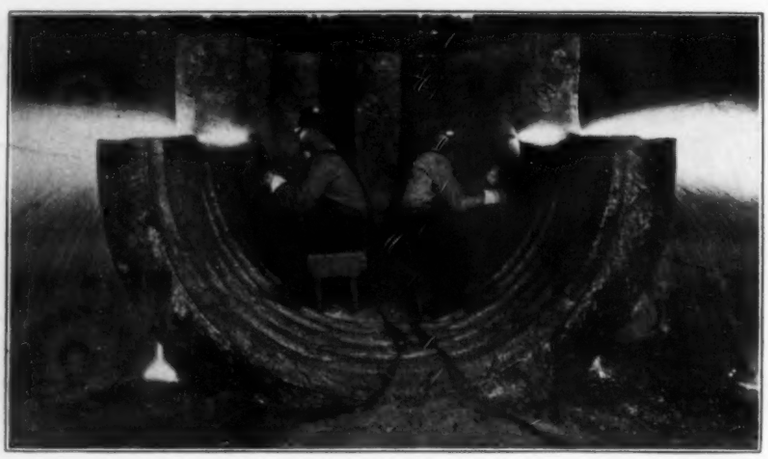
Dr. Jeffries is the fifth recipient of the Douglas medal and received recognition for distinguished achievement in nonferrous metallurgy. His chief achievements are developments of a method for measuring grain size of metals; explanations of the phenomena connected with grain growth in and deformation of metals and the effect on their physical properties; development of crystal analyses of metals by X-ray; theory of the causes of hardening of metals and alloys, especially steel, and the red hardness of high-speed steel. Aluminum pistons, heat-treated aluminum castings and new types of high-strength wrought aluminum alloys are some important developments attributed to Dr. Jeffries.

Test Mine Stoppings

Reinforced concrete mine stoppings, which are employed to prevent explosions penetrating from one portion of a mine to another should have the steel reinforcement carried well into the grooves cut in the sides, top and bottom of the mine opening, if the barrier is to resist explosion pressures, according to recent tests conducted by the bureau of mines and bureau of standards.

Illuminating Gas Cuts Risers

SINCE the adoption of illuminating gas to replace acetylene, hydrogen and other fuel gases in combination with oxygen for metal cutting, plants of the General Electric Co. have found many valuable uses for this new tool. The accompanying photograph shows two operators in the Everett, Mass., plant of the company cutting risers from a steel casting with oxyilluminating gas torches. By this method a 19-inch steel riser is cut through in 7½ minutes. As illuminating gas is cheaper than either hydrogen or acetylene, the new method reduces gas costs. Principal advantages claimed for the process are: 1. Availability; 2. elimination of delays and handling of tanks; 3. low cost; 4. safety; and 5. chemical and physical properties permitting the use of the gas in a torch equipped with a superheater, thus effecting marked economies in the amount of oxygen required by the cutting jet.



Oxygen Lowers Cost of Metal Cutting

(*Concluded from Page* 1615)

present in sufficient quantity results in rough cuts and retardation. The causes are the cooling effect on the reaction and the expansion of the water in changing to steam which tends to expand the cutting oxygen jet. By heating the oxygen to 200 degrees Cent., the moisture is changed to steam, the cooling effect is greatly reduced and the excessive expansion of the cutting oxygen is eliminated.

A quicker start is possible with a heated cutting jet and this becomes an important factor in applications such as rivet cutting or scrap cutting when many starts must be made. In machine cutting where heated oxygen is used, the face of the metal does not receive the chilling so prevalent with cold oxygen, thus eliminating the hardening effect on the face of the cut and reducing the subsequent machining costs.

There is a limit to which the oxygen should be heated because of the possibility of thinning the jet to a point where its oxidizing power is greatly reduced. For this reason superheated oxygen is not advocated for cutting sections much above 12 inches because the preheated oxygen coming in contact with the molten metal as it passes down through the cut causes further heating of the oxygen as the thickness of the metal increases. Above the limit previously mentioned oxidation becomes difficult or is completely arrested.

The value of high purity oxygen for cutting metal sections 15 inches or greater has been demonstrated, but average cutting applications cover a range of metal thickness much less than 15 inches; therefore its importance is minimized and limited to special applications. However, if conditions in the industry make a change to 98.5 per cent oxygen inadvisable, at least the principle of heating the cutting oxygen can be applied to the 99.5 per cent grade with an annual saving of considerable magnitude in the cutting industry.

Improving at Benwood

The Wheeling Steel Corp. has begun to rebuild the 36-inch blooming mill at its Benwood, W. Va., works and plans to have it ready for operation by June 1. The 12-inch skelp mill, with eight stands of roughing and six stands of finishing rolls, is scheduled to be completed by April 1. New cooling beds, runout tables and a blooming shear are being installed.

Analyzes Export Trade Gains

Growth of $1,000,000,000 in Sales in Last Four Years—Aggregate Shows Increase of 35 Per Cent Over Prewar Figures—Manufactured Products More in Demand—American Investments Abroad Total $11,000,000,000

By Dr. Julius Klein

IN THE period between the fiscal years 1922 and 1926, a growth of approximately $1,000,000,000 in the sale of American merchandise abroad has been concomitant with an increase from 505,000 to 2,032,000 in the number of trade-promotive services rendered by the bureau of foreign and domestic commerce. Direct and unremitting governmental aid for foreign trade, afforded through the many bureau agencies, may fairly be regarded as accounting for an appreciable part of the success that has been attained. The continuance and enlargement of this active service to American export interests will unquestionably be a vital factor in the maintenance of this country's position in world markets, which is a predominantly favorable and satisfactory one.

Those commodities whose exportation is most dependent on the efficiency of American industry and the energy and intelligence of American salesmanship, finished manufactures, have shown an absolutely unbroken and altogether remarkable growth. Exports of this class of goods in 1925-26 were no less than 60 per cent greater in value than in 1921-22. There had been, if anything, a fall in average export prices, so the quantitative gain was equal or greater.

Our exports of finished manufactures in terms of money value were nearly three times as great as the annual average in the five-year period preceding the World war. Even after allowing for higher price levels they were more than double.

Great Gains Since 1914

Our aggregate exports for 1925-26 were valued at $4,754,000,444, as compared with $3,771,000,000 in 1921-22 and an average of $2,166,000,000 for the prewar years 1910-1914. The increase over 1921-22 was thus 26 per cent, and no part of this was due to the advance in prices. After allowing for the diminished buying power of the dollars, the increase over prewar was in the neighborhood of 35 per cent.

Abstract of annual report to secretary of commerce. The author is director, bureau of foreign and domestic commerce.

Our imports have gained even more. They amounted in 1925-26 to $4,654,000,000, a figure somewhat swollen by the excessive price of rubber. This total was 71 per cent more than four years before, and over two and a half times as much as the average for the period of 1910-1914. Adjusted for the change in the price level, the imports of last year were 65 or 70 per cent greater than before the war.

Notwithstanding the fact that the United States has shifted during the past decade from a debtor to the world's greatest creditor nation, toward which imports tend to flow in payment of interest on a vast volume of foreign investments, our exports have continued to exceed our imports by a large margin. That the margin in 1925-26 ($287,000,000), as in 1922-23, was comparatively narrow was due chiefly to temporary causes.

On the average, for the five years 1921-22 to 1925-26, the so-called favorable balance in our trade was $685,000,000, exports exceeding imports by 18.8 per cent. It is worthy of note that the excess of exports tends to be lower when business in the United States is exceptionally active than when it is depressed. This is due to the fact that in times of high prosperity imports are stimulated by the demand for unusually large quantities of foreign food-stuffs for our tables and for other luxuries as well as raw materials for our factories. Then, too, prosperity in home markets lures many exporters from their oversea business because of the relatively quicker turnover in domestic sales of certain lines.

The continuance of a favorable balance of trade is chiefly due to the fact that we are constantly sending abroad huge sums for new investments. Were it not for such new placements of capital our trade would approximately balance, or there might even be normally an excess of imports. It is true that out of the proceeds of our merchandise exports we have to pay large sums for the remittances of immigrants to friends and relatives abroad and for the expenses of our hundreds of thousands of tourists. These items, however, are approximately offset by the inflow of interest and dividends from the investments already made abroad.

Foreign Investments Increase

On the average during the last three years our new investments in foreign countries have been nearly $900,000,000 annually. It is estimated that, apart from the obligations of the allied governments to our own government, the investments of Americans in foreign countries now total over $11,000,000,000 as compared with $2,500,000,000 just before the outbreak of the World war.

The total exports of finished manufactures averaged $654,000,000 annually before the war; in 1921-22 they were $1,211,000,000 and in 1925-26 no less than $1,937,000,000. Among the 40 or 50 major articles of this group, only four were exported in smaller values in 1925-26 than in 1921-22. In the case of three of these the larger exports in 1921-22 were due either to government sales of surplus supplies or to Europe's need for immediate rehabilitation of railroads and textile industry.

Exports of many major classes of manufactures were from two to nine times as great in the last fiscal year as only four years before. Sales of agricultural machinery gained no less than 343 per cent and the item of tractors more than 800 per cent. Foreign shipments of automobiles, parts, and accessories were more than four times as great last year as in 1921-22, and the gain for motor trucks was over 600 per cent.

Shipments of cash registers, adding and calculating machines, and related instruments nearly quadrupled, and those of construction and conveying machinery trebled. American leadership in most classes of machinery, vehicles, and labor-saving devices is strikingly illustrated by the figures. Remarkable as well has been the growth in exports of the advanced manufactures of iron and steel such as cutlery, tools, and hardware; of rubber goods and athletic and sporting goods; and even of such European specialties as chemical products, toys, and musical instruments.

Watch Your Grinding Costs

Many Factors Must Be Considered to Obtain Maximum Production With Minimum Expense—Expert Supervision Shows on the Profit Sheet

By C. C. Hermann

MAXIMUM production at minimum expense of wheels and labor should be obtained in foundry grinding operations. The same considerations apply as in any other grinding operations, the variation being a matter of degree only.

Efficiency as applied to rough grinding operations may be summed up briefly as follows:

It is important that the proper selection of grade and grit of wheel for the work at hand be made. For example, grinding white iron or hard iron previous to annealing requires an entirely different grit from that which the same castings will require after they are annealed. The wheel grit will be different from that used for gray iron castings and the grit and grade will vary for different wheel speeds or peripheral speed. Therefore it is paramount that some clear knowledge should be had regarding the action of different wheels when applied to different work and at different speeds.

Speed, that is, peripheral speed of the wheel becomes an important consideration and affects the efficiency of the wheel. Peripheral speed is a function of the diameter and at this point other factors must be taken into consideration, namely; wheel diameter and of almost equal importance with wheel diameter, the thickness of the wheel. However, this factor depends more upon the class of work than upon any other consideration.

Several factors affect the efficiency of the wheel in operation namely; *a*, balancing; *b*, trueing; *c*, dressing, and *d*, vibration. Vibration is an enemy of grinding wheel efficiency and causes more loss with increased wheel cost than any other factor. This is particularly true of foundry grinding, primarily due to the lack of competent supervision. The wheel wobbling at high speed delivers thousands of sledge hammer blows per minute on its grinding surface. A dangerous condition as well as inefficient.

A test of two different grades and grits of wheels was conducted by the writer during an investigation. The work produced by the two wheels was as nearly the same type as it was possible to obtain. The wheels were run on the same spindle and at the same spindle speeds. Due to one of the wheels being slightly larger when put on, there was a slight difference in the peripheral speed of the wheels, but this difference was not sufficient to cause any material variation in the results. The work consisted of rough grinding or snagging gray iron castings. The results are shown in the accompanying table. The grade of wheel *A* corresponds to a medium hard and although slightly under wheel *B* in peripheral speed shows a lower cost per man hour of production, based on the weight of work produced. Wheel *B* was also slightly heavier and corresponds to a medium soft grade. Due to its softness, the reduction in weight of the wheel was greater than with wheel *A*. The amount of metal removed per pound of grinding wheel weight was 68.6 per cent greater with wheel *A* than with wheel *B*. However, the reduction in wheel diameter is almost the same. This is due to wheel *B* glazing over readily, resulting in considerably more dressing of the wheel which made it cut more rapidly but the amount of grinding medium removed by dressing was excessive. Wheel *A* is a more efficient wheel for the work than wheel *B*, although the efficiency of wheel *B* could have been increased by increasing its speed to around 5500 feet per minute. This would only be an emergency change as speeds above 5500 feet per minute are not recommended for rough grinding and snagging. It would be better judgment to select a slightly harder grade. The grit used in wheel *B* is slightly coarser than in wheel *A* and this accounts for some of the reduction. Larger grains are more easily dislodged from the face of the wheel than smaller grains and the possibility of soft spots in the wheel is greater with the larger grain.

Select The Proper Type

The proper selection of the grade and grit of grinding wheels cannot be too emphatically stressed. In some of the factories encountered by the writer, the grinding department foreman is not consulted in purchasing, consequently his experience with different clases of wheels is lost to the company. By close co-operation between the purchasing department and the foreman or superintendent of production departments, many errors in purchasing may be eliminated. A close study by the engineer in charge of production, more than pays for itself. Where such services are not available an outside engineer should be consulted as expert advice is an investment that pays good dividends.

Peripheral speed of the wheel face influences the efficiency of the wheel as stated previously. The speed of the arbor is only incidental to maintaining the peripheral speed. Where large wheels are used and the arbor is not provided with variable speed control, arbors of different speeds should be provided. When the wheel diameter has been reduced to a point where the peripheral speed of the wheel is below 4000 feet per minute, it should be removed to another arbor having a speed sufficiently high to bring the peripheral speed up to 5500 feet per minute. Speeds of 6000 feet per minute are in use where the work is held rigidly and where the feed of the work to the wheel is under control. For rough grinding and snagging the maximum speed is about 5500 per minute.

A grinding wheel must be mounted properly to make it safe in every way. Flanges must be of proper diameters for the corresponding diameter of the wheel and changed to smaller diameters as the wheel wears down. The operator should never attempt to save time by skipping a set of flanges making a larger reduction in flange diameter than should be the case. Another thing that should be watched carefully by those in charge of grinding work, is that the flanges used are of the same diameter. Once in a while some of the flanges are misplaced and two flanges of the same diameter cannot be located in a moment. The consequence is that flanges of different diameters are taken. The effectiveness of the flanges is no greater than that afforded by the smaller flange.

In fact flanges of different diameters take a bearing on different points of the wheel causing an unnatural stressed condition to exist and may cause bursting of the wheel.

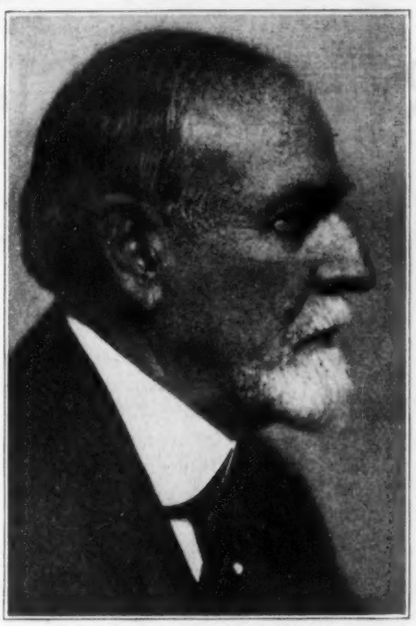
Wheels should be amply guarded by a strong hood. The writer has seen hoods made out of sheet steel extending from some support above the wheel and projecting slightly forward and without sides. Such hoods are no protection. This is a matter that is generally controlled by state law and it is a matter that every one responsible for grinding departments should look after without the necessity of law regulation. Hoods are a bother sometimes but they are such vital protection that the bother should be forgotten. See that the side of the hood is replaced after changing wheels or flanges. The hood side is often laid aside and forgotten. The best way to regulate the replacement of the hood side is to secure the side to the hood by a chain or better yet by hinges. The hood should be adjusted occasionally so that the forward edge is the proper distance away from the wheel. This is important from the standpoint of safety as well as to facilitate getting the work close to the wheel.

All wheels presumably are balanced before being shipped by the maker. Where a balancing-way is available, no harm is done by checking the balance before placing the wheel on the arbor. The maker balances the wheel by inserting lead near the hole of the wheel. This balance is within narrow limits and seldom can be improved upon in the average shop. After the wheel has worn down somewhat, the balance may be off and can be corrected readily by removing sufficient lead.

A wheel out of balance is a bad state of affairs both from the safety standpoint and from the rapidity of wear. Imagine a situation where there are just a few ounces too much weight on one side of the wheel near the periphery of the wheel, and revolving at a speed of 5500 feet per minute. It would exert a pull on the arbor sufficient to spring the arbor due to the centrifugal force. As the high point comes around to the work held in the workman's hand the arbors bend and buckle thousands of times per minute and you have a picture of the likelihood of the arbor snapping off and sending the heavy wheel through the shop perhaps killing or maiming several workmen. Again imagine every time that the high spot comes around to the work, a sledge hammer blow is dealt the wheel, and if a crack does not develop across the wheel thereby resulting in the loss of the wheel, certainly its life will be materially decreased due to the pounding off of small particles of abrasive.

Industry Pays Tribute To Publisher

A REMARKABLE tribute to the upbuilding service which he personally and through his publications has rendered to industry was paid to James H. McGraw, president of the McGraw-Hill Publishing Co., by a



JAMES H. McGRAW

company of 1000 of the country's leading representatives of the engineering, manufacturing, public utility and publishing fields at the Hotel Astor, New York, Friday evening, Dec. 17. The occasion was Mr. McGraw's sixty-sixth birthday. Those who attended the dinner pronounced it to be the most notable appreciation ever paid in a formal fashion to an American publisher.

The guest of honor was lauded for his fine idealism and for his practical contributions toward the development of the efficiency, magnitude and progress of the branches of business which the McGraw-Hill publications cover. John W. Lieb, vice president of the New York Edison Co., presided. Speakers were Gen. Guy E. Tripp, chairman of the board, Westinghouse Electric & Mfg. Co.; Dexter S. Kimball, dean of Sibley college of engineering, Cornell university; Edward J. Mehren, vice president of the McGraw-Hill company; Willits B. Sawyer, president of the American Railway association. Arthur Williams of the New York Edison Co. was chairman of the committee that arranged the dinner.

Among those present were Owen D. Young, chairman of the General Electric Co.; Gerard Swope, president of the General Electric Co.; Newcomb Carlton, president of the Western Union Telegraph Co. and many others of high rank in the nation's commercial life.

The House of Tomorrow

(*Concluded from Page* 1617)

wider use of steel. Due to methods developed in this construction Mr. McKay estimated that erection of the next framework will cost only $150 instead of $252.

The combination of steel and wood at present seems most advisable. Public sentiment has not been developed sufficiently as yet to favor a wider employment of steel. Contractors find considerable difficulty in getting metal sash adopted for home use, and metal trim is vetoed in favor of the standardized wood.

Steel fabricators have a wide opportunity in the domestic construction field for the development of products which are more economical in application than other materials. Millions of dollars have been spent in advertising patented composition sheathings but although giving good insulation offer no fireproof facilities. Metal lath has the fireproof qualities but offers no insulation. Steel sheathing is more fireproof than wood and than most composition materials, but it offers no insulation.

Other examples also might be offered of possibilities for increased use of steel in domestic structures. A broad educational policy will be necessary, however, before the general public realizes the advantages of steel construction and demands fireproof homes. Department of commerce reports indicate that about 266,000 homes were built in the United States in the first six months of 1926. Mr. McKay estimates that the average six room house should require from 8 to 12 tons of structural steel.

One of the first problems in such a program of distribution would involve enlisting the co-operation of steel jobbers, structural fabricators, architects and builders. This groundwork is necessary before public approval is sought so that demand developed might be accommodated adequately.

Fig. 1—Five electric furnaces in the steelworks department which produce 235 tons of special analysis nickel-molybdenum steel daily

Bearings Require Clean Steel-I

All Raw Materials Charged Into the Electric Furnaces Are of Selected Grades—Chips and Turnings Are Pressed Into Briquettes—Care Is Exercised in Preparing the Ingot Molds and in Pouring the Metal

By John D. Knox

UPPERMOST in the minds of operating men associated with electric steelmaking departments, is the matter of clean steel, for upon this objective depends the quality of the finished product. Perhaps in no steelworks' melting department in this country is greater care exercised to obtain clean steel consistently than at the plant of the Timken Roller Bearing Co., Canton, O.

A large part of the steel produced at this particular works is used in the manufacture of roller bearings, as the name of the company would imply. Approximately 297,000 finished bearings is the outcome of a day's run and these are used for a multiplicity of purposes, including all types of industrial machines, motors cars, trucks, tractors, and other equipment designed with revolving motion. Safe transportation, whether by automobile or train, has a direct relation to the quality of steel employed in the construction of the conveyance and with the roller bearings finding wider application in this direction, the importance of clean steel was recognized early by the Timken company.

Practically all scrap shipped into the plant from outside sources is of selected grades and upon arrival is given a rigid inspection. Moreover, only pure grades of alloys are used in the production of steel, which, at this particular plant, is a carburizing grade. All steel intended for bearings is of low-carbon content and contains certain percentages of nickel and molybdenum. The demand for this grade of steel is becoming larger right along because of its ideal carburizing properties.

FIG. 2—ALL MOLDS ARE WASHED AND BRUSHED

Two preliminary chemical analyses are made on each heat and these are followed by a final analysis before the steel is poured. Another analysis of the steel is made after it passes through the blooming mill. A close check is maintained on the sulphur content of the steel. Instead of purchasing burned lime in the market, the company buys limestone and a special grade of coal with a low-sulphur content and prepares its own burned lime in a kiln erected near the electric furnace department.

Another means employed by the Timken company to obtain clean steel is that in tapping each furnace the slag is held back and not permitted to flow into the ladle at the outset. This is accomplished by a round tile, bricked and clayed in the pouring spout and offset 4 inches from the bottom of the hearth. As the furnace is tilted, the metal flows through the tiled nozzle into the ladle and not until the latter part of the pour does the slag start to come. By this arrangement little opportunity is afforded the slag to mix with the metal in the ladle. Instead it merely serves as a blanket and prevents the escape of considerable heat.

Before the ladles receive the metal from the furnaces they are blown

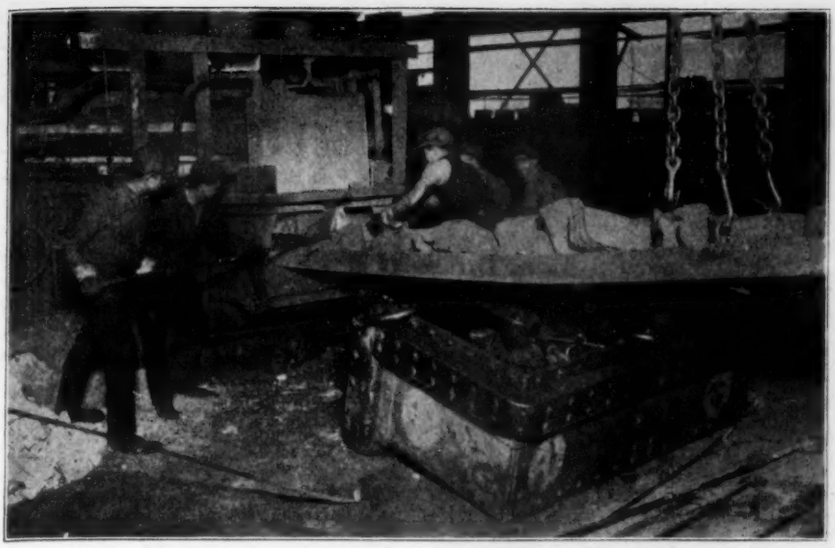


FIG. 3—CHARGING CROPS AND OTHER SCRAP INTO ELECTRIC FURNACE

steel shavings and borings are made each day. These are reclaimed by being compressed into solid bale or briquette. A large portion of the turnings originates at the several hundred automatic machines for turning out the cones and cups for the roller bearings. Another portion arises as a result of the work performed by the many hundred automatic screw machines in the plant. Still another portion of turnings is produced by Brightman-type machines in the finishing end of the tube mill.

These machines are equipped with a rapidly turning head with cutters which skin the tubes. As the surface of each tube is being dressed, the chips and cutting compound fall in a common tunnel built beneath each machine. The cutting compound drains from the turnings and flows into a pit at the end of the tunnel. The oil is used over and over again. A monorail crane, from which is suspended a magnet, operates from one end of the tunnel to the other. The magnet while traveling from the back to the front of the tunnel is energized and picks up the chips that accumulate on the floor. When the magnet arrives at the front end of the tunnel the current momentarily is shut off and then turned on. Meanwhile the chips drop into a chute and the magnet and trolley return to the rear end of the tunnel. As the magnet approaches its limit of travel it again is reversed automatically and moves toward the head of the tunnel, picking up the turnings while in transit. This cycle is repeated continuously.

The turnings dropped on the chute

out with compressed air and swept clean. Moreover, the interior of each mold first is cleaned with a wire brush and then is heated and coated on the interior surface with a material which prevents the steel sticking. The top of the mold then is covered to exclude all foreign matter. All ingot molds used at this plant are of the inverted Gathman type and are equipped with a generous hot top to secure sound ingots.

Out of every 100 tons of steel manufactured by the company approximately 18 tons actually is shipped in the form of roller bearings. Approximately 50 per cent of the seamless tubes, from which the roller bearings are fabricated, is reclaimed in the form of turnings. In the Canton and Columbus plants of the company approximately 112 tons of

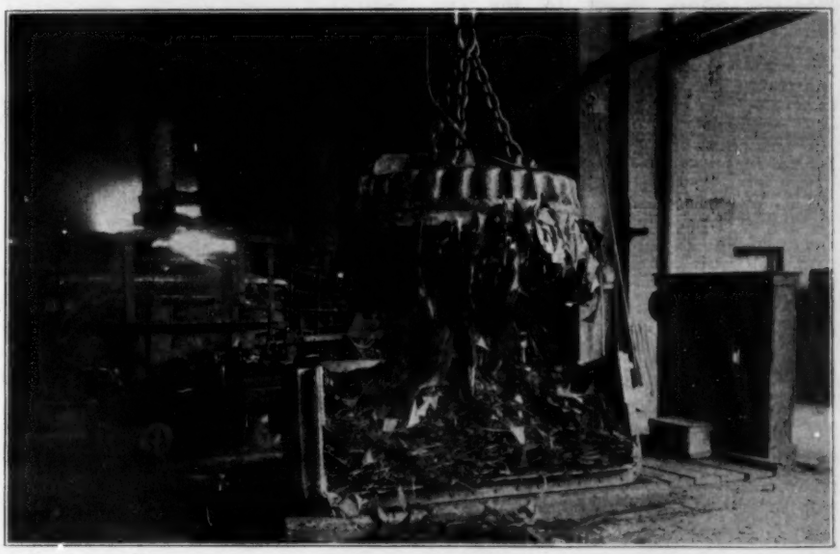


FIG. 5—HIGH-GRADE SCRAP USED FOR THE FURNACE CHARGE

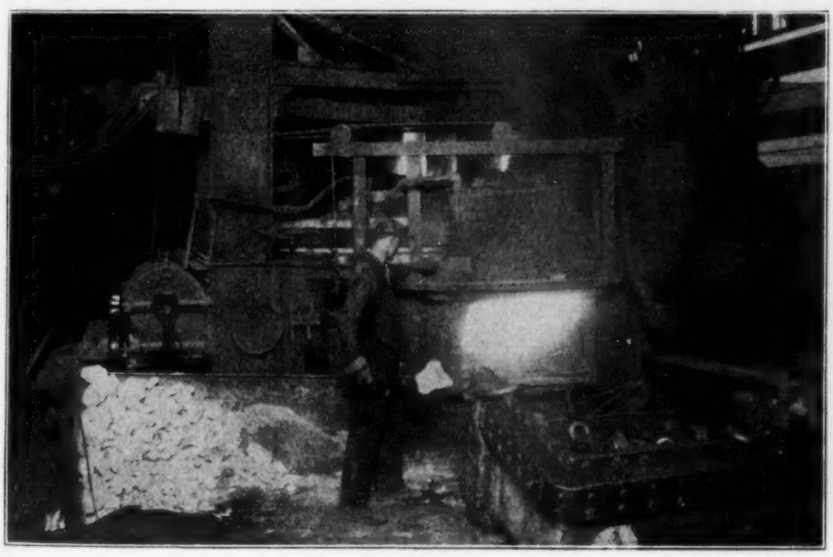


FIG. 4—MAKING SLAG IN ONE OF THE ELECTRIC FURNACES

at the forward end of the tunnel are blown through a 12-inch pipe for a distance of 360 feet to the briquetting building. These and the accumulation from other departments, as previously mentioned, are conveyed through a washer. The bottom of the conveyor is perforated and as the steel progresses through the washer a large portion of the oil clinging to its surface is removed and drains into a sump. The oil coming to the top of the water in this sump passes through a purifier and is recirculated to the various automatic machines.

The conveyor discharges on a chute. This feeds the chips and turnings into a path of a strong blast of air which blows them into the briquetting building. An electric magnet suspended from an overhead traveling crane transfers the washed turnings either direct to the two hoppers, which serve the briquetting machines, or, deposits them on a platform near the hopper. Three men rake the scrap from the platform into the hopper, which in turn feeds it into the magazine of the briquetting press. The latter, which is installed in one corner of the building, is built with two horizontal plungers. These are operated through a crankshaft by a 75-horsepower motor.

Raker bars pull the chips from the hopper and pack them in the magazine

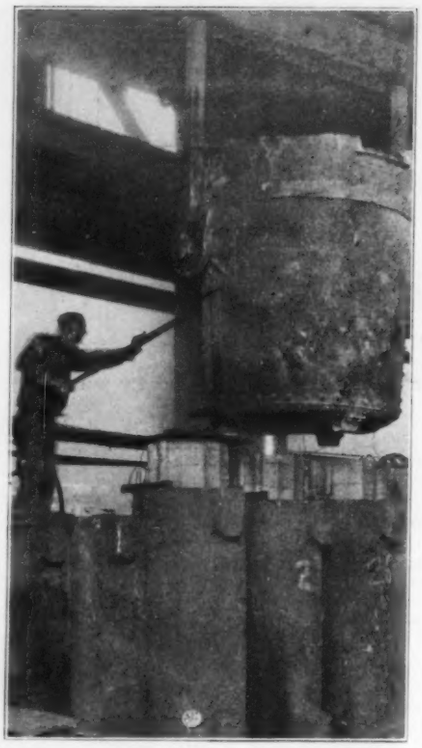


FIG. 7—BOTTOM POUR LADLES, WASHED MOLDS AND FURNACE PRECAUTIONS INSURE CLEAN STEEL

of the briquetting press. The ram exerting a pressure of 350 tons forces the material into briquette form. The pressure exerted by the press may be varied by merely turning a valve which regulates the pressure. The thickness of the briquette is contingent upon the pressure. Considerable oil is squeezed out of the turnings during the compression stroke and flows into container beneath the machine. After the oil is reconditioned it is recirculated to the various automatic machines. The briquettes are cylindrical shape. In this form they are more economical to produce than if they were made rectangular or some other shape. They are 7 inches diameter, from 3½ to 4 inches long and weigh approximately 22 pounds. Under normal operating conditions the briquetting machine produces ten briquettes a minute.

As the briquettes are ejected from the press they drop into a bucket conveyor which elevates and discharges in a hopper. The latter feeds them into a briquetting furnace where they are burned. Although considerable oil is drained and washed from the scrap and turnings and still another portion of oil pressed out during the briquetting process, a certain portion still remains in the briquette upon arriving at the furnace. The composition of the compressed scrap at this stage is 70 per cent solid matter and 30 per cent voids. By voids are meant the spaces which are filled with the oil. As the briquettes are not desirable with such a high oil content, it is necessary to elminate it. This is ac-

(*Concluded on Page* 1628)

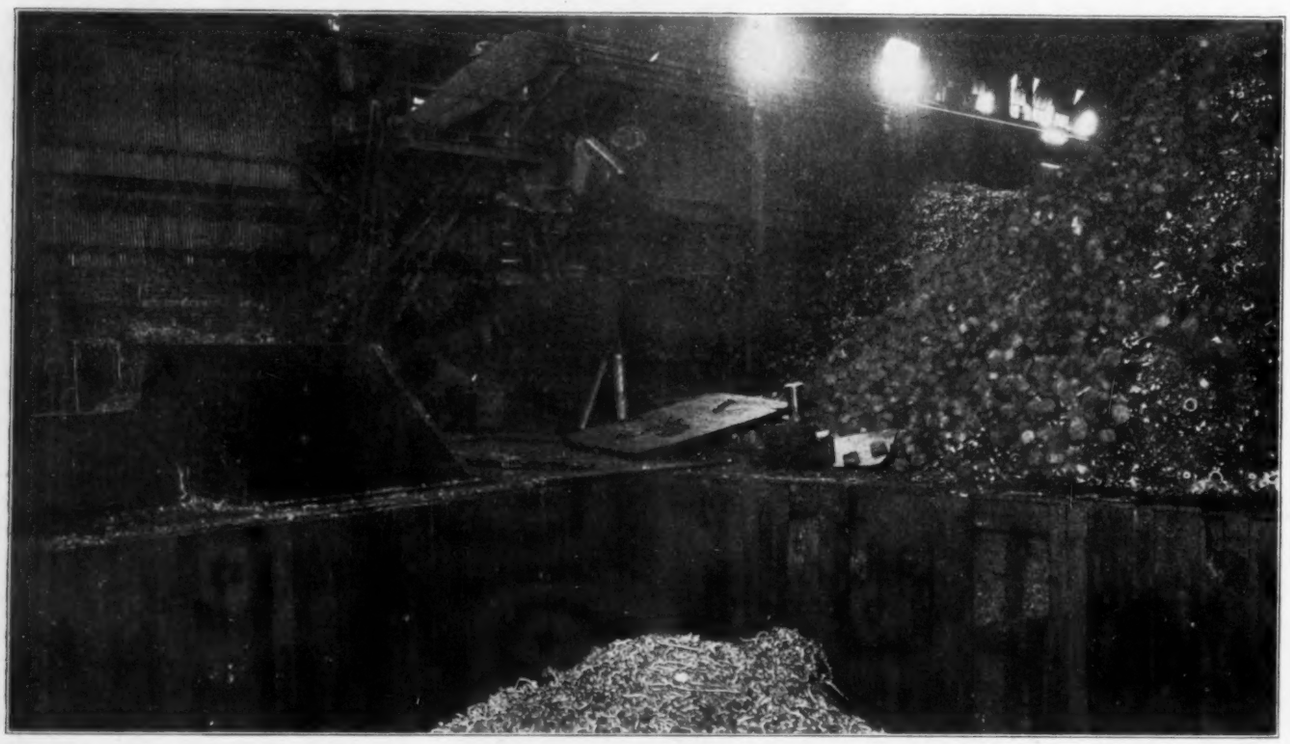


FIG. 6—MORE THAN 100 TONS OF STEEL TURNINGS ARE RECLAIMED DAILY BY THE BRIQUETTING MACHINE. THE HOPPER FEEDING THIS MACHINE IS SHOWN AT THE LEFT, THE CONVEYOR AND FURNACE IN THE BACKGROUND AND BRIQUETTES AT THE RIGHT

Industrial Furnaces

A Treatise on the Design, Construction and Function of Modern Melting, Heating and Treating Units

By Charles Longenecker

Chapter IV (Continued)—Reheating or Finishing Furnaces

FOR heating steel the continuous furnace approaches more nearly the ideal than any other type. It embodies those features found most conducive to high operating efficiency. Steel of practically any composition may be heated under the most advantageous condition both as regards quantity and quality of output. Combined with these characteristics is the benefit to be derived from a low fuel consumption, provided the furnace is correctly designed and operated. This type of furnace functions at its highest efficiency when serving mills from which a large tonnage of a certain section or shape, is demanded. Frequent roll changes reduce furnace efficiency.

The first furnace that evidenced any appreciation of the benefits to be derived from the continuous feeding and drawing of metal, in the form of billets, was built by Gustav Ekman in 1843. This furnace is shown in Fig. 35. The billets were charged into the furnace through a small door located near the stack end where they remained until their temperature became fairly constant. They then were withdrawn and recharged through another door nearer the firing end. By a continuance of this procedure the billets finally reached the hottest zone where, on attaining the proper temperature, they were removed and rolled or forged.

Principle Is Analogous

This method of heating by slow progression to a high temperature zone, is analogous to that carried out in continuous furnaces of the present day. Another similar feature is the incorporation of a recuperator by which the air for combustion was heated to the required temperature.

An improvement over Ekman's manner of moving the billets along the furnace hearth was the procedure followed in operating the roll-over furnace at Hoerde, Germany. In this furnace billets of octagonal cross-section were charged and, as their temperatures increased, they were rolled over the entire length of the hearth until they attained the desired temperature at the discharge end.

About 1880 William Allen, then superintendent of the Henry Bessemer Works, Sheffield, England, employed the same principle as at Hoerde but on the hearth of his furnace he laid wrought iron pipes on which the billets were moved. Through these pipes he circulated water as a cooling medium and thus originated the water-cooled skid pipe. The motive

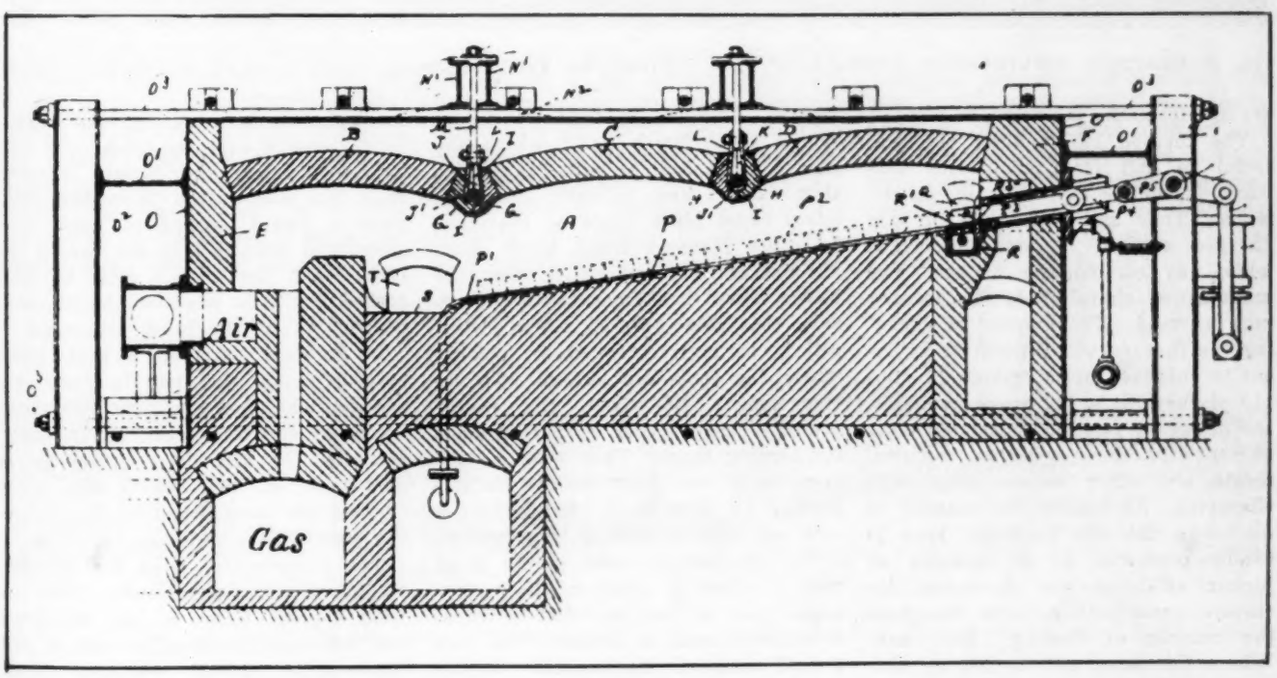


FIG. 32—EARLY DESIGN OF THE MORGAN TYPE CONTINUOUS FURNACE WHICH WAS DEVELOPED FOR USE WITH CONTINUOUS MILLS

power to push the billets over the pipes, was furnished by a hydraulic ram.

All the essential features necessary for the construction of an improved type of heating furnace were available at that time but the impetus to make such a furnace a reality did not appear until the continuous mill was an assured success. When Bedson, Garrett and Morgan had placed this mill beyond the experimental stage the continuous furnace, known as the Morgan type, was developed. An application for a patent on this furnace, was filed May 7, 1894. The design which appeared with the patent specifications is shown in Fig. 32.

The method of handling the material to and from continuous furnaces is similar in practically all designs. They are either end or side charged or end or side discharged while any combination of the two methods of charging or discharging may be used. The manner of charging the furnace will depend on its location relative to the source of supply of the billets, the space available, the design of furnace considered most efficient for the particular requirements, and other features of a local character. As regards the manner of discharge the side-discharge type is to be preferred as it operates at higher efficiency but in many instances consideration must be given the manner of feeding the mill. Where the same mill is fed by several furnaces these are usually of the end-discharge type. As a rule the discharge opening in the side-discharge type of furnace, is in direct line with the first pass of the rolls and frequently the forward end of the billet is in the rolls before the rear end has left the furnace.

Skids Are Provided

The billets pass through the furnace on some form of skids. These may be either the usual water-cooled skid pipes or some other form of metal skid, not cooled. An urgent demand exists for a skid which need not be cooled but which will still be durable. Cooling not only necessitates a continuous supply of water but also reduces efficiency in that the water carries away much heat; where the pipes are in contact with the billets, they extract heat to such an extent as to cause black spots on the steel. In some furnaces these black spots are not entirely eliminated when the billets leave the furnace with the result that the finished piece, when rolled, is marred at those places where the spots are located. To obtain longer life from the water-cooled pipes provision should be made for turning these. Then when a pipe is worn at one point on the circumference by turning it 180 degrees a new and unworn surface is presented.

The practice in some plants is to weld a strip of steel to the water-cooled pipe so that the billet in transit will not come in contact with such a cold surface. For various reasons this idea has not been adopted generally. Experiments with skids made of heat resisting alloy steel have proved successful and such metal ultimately may be extensively used instead of the water-cooled pipes.

Cast-iron skids have been installed in furnaces with varying success. They must be renewed periodically because this metal, after normal expansion, has a growth which unduly increases the size. There is also the waste from oxidation and deformation.

In the side-discharge furnace, the billets after leaving the skids, drop or pass onto a hearth of brick which usually is magnesite. These brick are laid on edge in herringbone fashion, so that the progress of the billet in passing over the brick, will not be impeded. If the design is such that the billets drop from the skid pipes a heavy section of steel frequently is imbedded in the hearth in order that the impact will be absorbed by this piece of metal and destruction of the brick prevented.

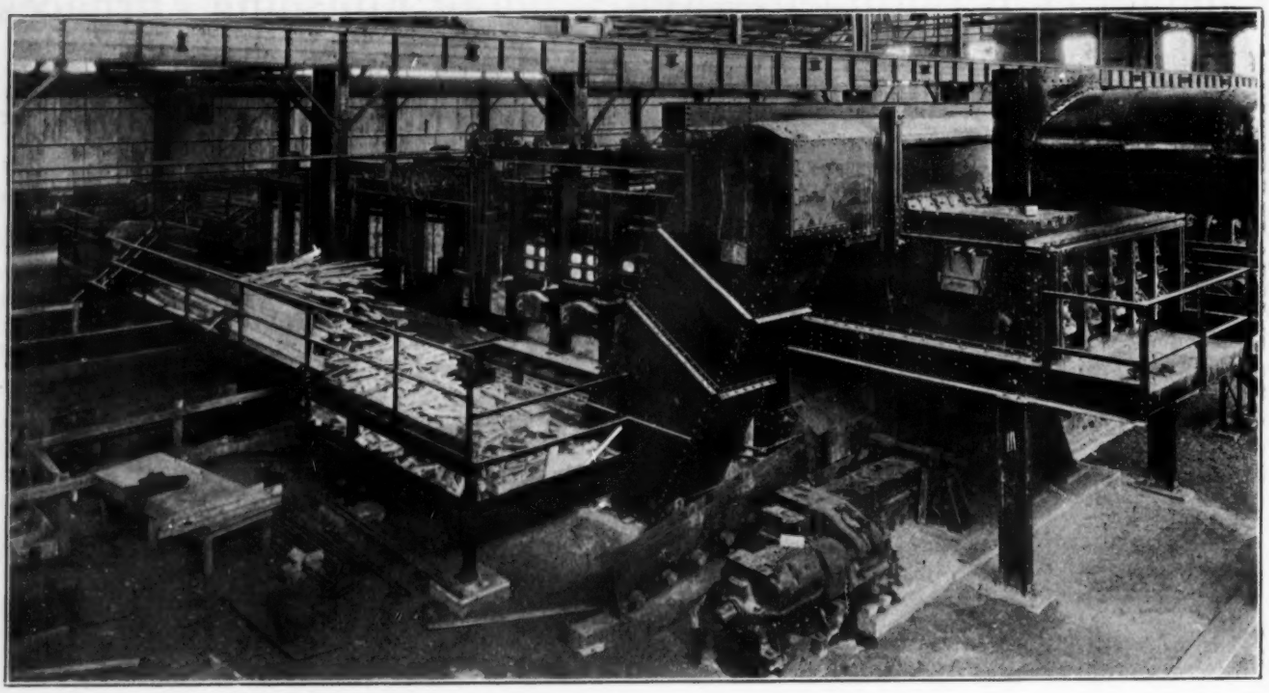


FIG. 33—GAS-FIRED RECUPERATIVE FURNACE OF THE CONTINUOUS TYPE EQUIPPED WITH A FLAT SUSPENDED ARCH

In furnaces carrying a high temperature some slag will be found at the discharge end and provision must be made for its removal. In some furnaces the slag is collected in a depression in the hearth and then drained off through a small door in the side wall.

The temperature over the furnace width, should approximate 2500 to 2600 degrees Fahr. at the discharge end while at the charging end, it will vary under normal operation from 1100 to 1600 degrees. For alloy steels these temperatures will be lower. The

temperature at the charging end will be influenced by the length of the hearth because the longer the row of billets, the greater will be the absorption of heat with a consequent reduction in the temperature of the gases. Another factor affecting temperature is the thickness of the steel heated. Billets, say 2 inches thick, absorb heat more rapidly than those of greater thickness; hence, the temperature of the gases at the charging end is higher when thin billets are heated. The rate of heat absorption by the steel varies as the square of the thickness of the metal. Hence, when heating billets of different thicknesses in the same furnace, the time of heating will be longer for the thicker billets. From the foregoing it is apparent that the length of the hearth of a furnace is dependent upon the tonnage to be heated and the thickness of the steel charged.

Forms Solid Mass

When the furnace is fully charged the billets, resting on the skids, form a solid sheet of metal the full length of the skid pipes. To heat this sheet of metal the flame may pass over it, or the skid pipes may be elevated on piers, and the hot gases be made to pass both above and below. In the first instance the heating will be entirely from above while in the latter case the split flame will impart heat both to the top and bottom of the billets. Theoretically the split flame method is better but in practice it is not popular as the piers burn away while the gas passages become clogged with scale unless cleaned frequently.

A distinct departure in roof construction was inaugurated with the advent of the modern continuous furnace. Before this furnace appeared the typical roof was of the sprung arch type but on the Morgan type furnace it was formed of several transverse arches sprung from a suspended skew back tile as shown in Fig. 32. The roof, due to the corrugations, has a large radiating surface. The Morgan furnace also is built with a flat suspended roof. This form of roof, termed the flat suspended arch possesses advantages which appeal strongly to furnace operators. These include ease of repair, equal distribution of heat over the furnace hearth, durability, and the fact that the roof is in every way independent of the side walls and thus imposes no weight. Fig. 34 illustrates an arch of the latest design installed within the past year. In this design a secondary roof is superimposed on the main brick arch, with a passage way between, through which a current of air blows. This air, sweeping over the furnace roof proper, is preheated several hundred degrees while at the same time the temperature of the arch is reduced and its life greatly extended.

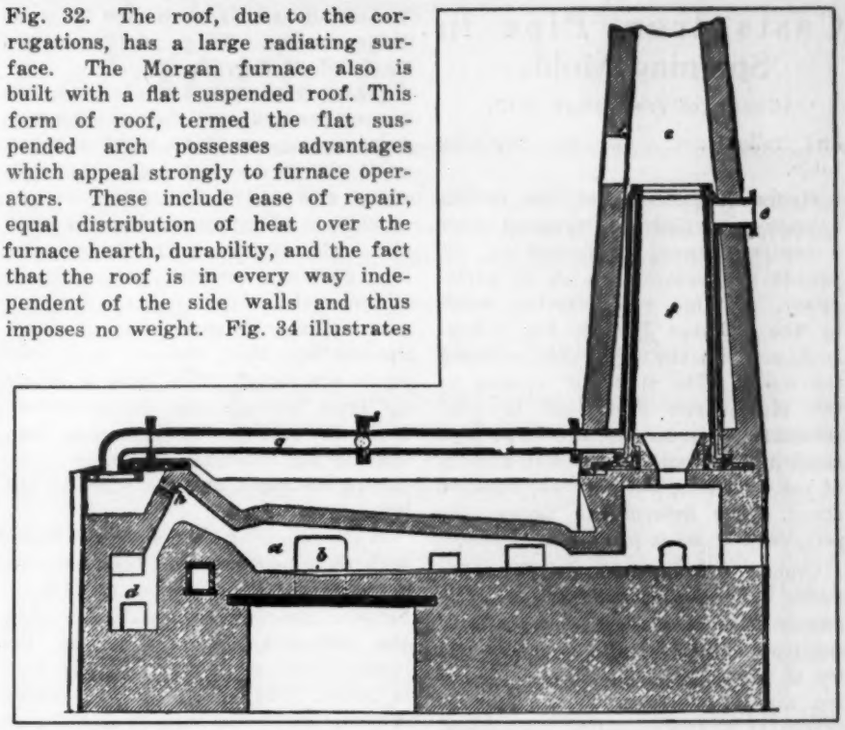


FIG. 35—EKMAN TYPE FURNACE IN WHICH BILLETS WERE HEATED BY SLOW PROGRESSION

Control Is Necessary

Of paramount importance is the burner equipment. Not only must the burners be of the correct design but it is imperative that proper control of the fuel and air be exercised. This control may be done by hand or automatically, but, for the maintenance of high efficiency, it must be exacting. Regulation is accomplished with less difficulty when burning fuels in the gaseous and liquid state.

Burners for gaseous fuels are of the pressure and the aspirating types. In the former both the air and gas are delivered under a definite pressure and mix at the burner tip, or close thereto. Burners of the aspirating type function under a set pressure of gas, the flow of which, induces air in the proper proportion for combustion. In this type the mixture of air and gas is effected within the burner.

Placing his company's recent fire loss at $40,000, Frederick W. Stickle, president of the Capitol Foundry Co., said that he hoped to rebuild in Hartford, Conn., and to continue the business. Until some place can be found for plant operations, 80 men will have to seek other employment.

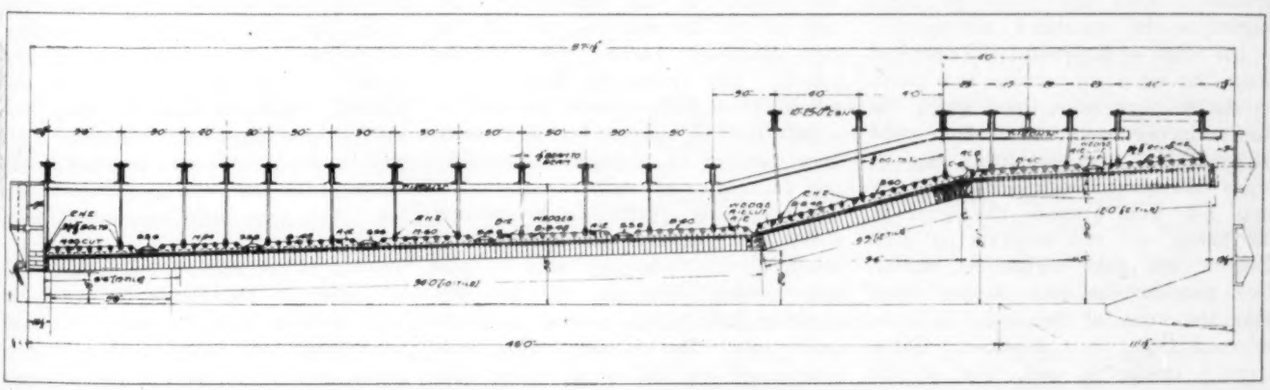


FIG. 34—CONTINUOUS HEATING FURNACE EQUIPPED WITH A FLAT SUSPENDED ARCH AND A SECONDARY ROOF SUPERIMPOSED ON THE MAIN BRICK ARCH

Casts Iron Pipe in Spinning Molds

(*Concluded from Page* 1613)

and rolled out upon the receiving table.

Hydraulic pressure of the various operations outlined is supplied from a central source, maintained at 500 pounds per square inch. A 15 horsepower, variable speed motor, made by the Reliance Electric Co., Cleveland, supplies the power for spinning the molds. The speed of rotation of the pipe varies from 500 to 1500 revolutions per minute, the large pipe requiring, of course, a greater amount of molten metal, but a slower rotative speed. The determining factor, the peripheral speed is practically uniform.

Cranes and rigs for handling the flasks and poured molds are sufficiently unusual to merit more detailed description. Two cranes provide service of this nature for all twelve casting machines. Each of the pair of cranes is a special 5-ton, high-speed, bridge-type traveling unit built by the Niles Crane Corp. Philadelphia.

A circular plate, similar to a turntable platform, is fastened rigidly to the yoke and provided with slots which are engaged by magnetically operated dogs. These serve to lock the hanging yoke either parallel with or at right angles to the crosshead.

Each end of the yoke is provided with two short steel members, which when dropped outward, form a V-shaped support. These members are hinged to the sides of the yoke and when raised are locked within recesses in the sides. Short triggers extending outward from the sides of the yoke above, serve to release the lower members as desired.

In operation, this lifting rig is so ingeniously contrived as to eliminate all need for manual hooking on to the flasks. The craneman handles the flasks by operating entirely from his cage without any assistance from the ground. With the yoke at right angles to the crosshead, but parallel to the brige of his crane, the operator drops the rig down between two flasks on the delivery rails, upon which the flasks have been rolled from the tilting table after molding. As he drops the yoke downward until the ends are well beneath the level of the flasks, the two triggers on each arm of the yoke strike the flasks. This permits the four hinged arms near the ends of the yoke to open outward from their recesses. These form a cradle at each side of the yoke, of the two hinged members. As the rig is raised the flasks are picked up gently from the rails in these cradles. They are turned an angle of 90 degrees.

They then are carried to the proper position over the rails between two casting machines and lowered, until the flasks rest upon the rails along side and between two casting machines. The rig is lowered with the ends of the yoke going down into openings beneath, just sufficient to pass the ends of the yoke, but pushing the hinged members back upward into their recesses until they again are locked. The yoke is drawn up from between the flasks leaving them in position to be rolled into the casting machines at either side, one to the right and the other to the left.

When removing the completed flasks with their new castings, the operation is reversed. The yoke is lowered between the two poured flasks, until the extended triggers release the lower hinged members. The rig then is raised, picking up the two molds in their cradle-like support at the side of the yoke. As the crane lifts the rig, it is traveled long, causing one end of a flask to strike an upright structural member placed for that purpose. This starts the yoke turning, the magnetic lock having been released, and as the crane travels toward the center of the shop to deliver the flasks to the sand removal station, the yoke slowly turns until it is at right angles with the bridge of the crane, where the magnetic locking dog again drops into a slot and holds it exactly in position to deliver the flasks.

Clean Steel Required for Bearings

(*Concluded from Page* 1624)

complished by burning the briquette in the furnace where there is a continuous fire. The fuel consumed in this furnace is the oil which fills the spaces in the briquettes. At the end of 30 minutes, the oil has been entirely burned out of the spaces. The briquettes then are removed from the furnace, stocked in a pile by the magnet and are ready once more to be remelted in the electric furnaces.

Before this particular briquetting press was installed the practice followed by the company was to pile the various turnings in the briquetting building and permit the oil to drain out. The turnings then were compressed by two scrap baling machines, which operated 20 hours a day and baled 72 tons of scrap. The capacity of the present briquetting machine is 7 tons an hour, or 112 tons each day of 16 working hours. Only five men working 8-hour shifts are required to operate the briquetting press, whereas 18 attendants working 10-hour shifts were needed to look after the balers.

Additional scrap material is obtained from the blooming mill, the tube mill and various other operations. This with the high-grade scrap purchased from outside sources and the light scrap in the form of briquetted borings and turnings is charged directly into electric furnaces. Necessary alloys, such as nickel and molybdenum are included in the charge to make a special analysis steel suitable for the manufacture of roller bearings. Five heroult-type electric furnaces with a normal rating of 6 tons each comprise the steelmaking facilities.

The practice followed by the steelwork's division is to melt down a charge of 18,000 pounds from 1¼ to 1½ hours, using power at 180 volts. During the refining process, however, which requires approximately 2 hours, a lower voltage is used. Each 6-ton furnace is served by a 2500 kilovolt-ampere transformer.

Approximately 75 per cent of the steel mill capacity is used in the manufacture of bearings. The remaining 25 per cent is sold to outside consumers. By this arrangment, therefore, the company is protected against unusual shipping demands and at the same time against peak requirements. At present, however, the company has under construction a basic open-hearth furnace of 100 tons capacity, two electric furnaces of 15 tons capacity each, and one electric furnace of 7 tons capacity. This steelmaking equipment is to be housed in a separate building. When completed and in successful operation, the company intends to abondon its present electric furnace installation.

As previously mentioned the steel is tapped from each furnace through a round tile inserted in the pouring spout for the purpose of securing clean steel. The ladle receiving the metal is transferred by crane to the pouring platform located along one side of the steel mill building. All steel is top poured into inverted fluted molds, equipped with a generous hot top. This type mold permits uniform contruction of the steel. Ingots are allowed to set without disturbance for a period of 1½ hours before being sent to the 35-inch blooming mill. Each heat is poured into the four ingots molds and these, resting on an ingot car equipped with Timken bearings, are transferred to the soaking pit.

Editorials

Steel Corporation Expresses Faith

OF THE United States Steel Corp., it has been said that its dividend policies, once adopted, have always represented a conservative appraisal of its own earning ability and of fundamental business prospects. In declaring the 40 per cent dividend payable in common stock, the directors of the corporation give notice that the time has arrived when capitalization of a portion of its great surplus may now safely be undertaken. This implies a more generous distribution of earnings to stockholders. Behind this is the faith of the directors in the basic soundness of economic conditions and in the outlook for continued good times.

This aspect of the dividend action has produced a profound effect upon financial and business sentiment and ranks it as one of the most important financial developments of the year. It has helped to brighten the business prospect for 1927. The implied belief of the directors of the corporation that large earnings are to continue, is justified by underlying factors. One of the most striking of these involves the steel producing capacity of the country. After the war it was the fashion to talk of the great margin of excess steel making capacity. As a matter of fact much of the added war demand was supplied by high cost plants, impractical for peacetime use.

Actually, however, considerable expansion of plant did take place. But from the evidence supplied so impressively in 1926 it seems clear that the normal consumptive requirements of the nation have about overtaken the productive facilities of steel. During the year steel works operations were maintained very near the limit of their practical capacity. This was done without overstimulated buying or any pyramiding of unfilled orders. It was done, moreover, without any important purchasing by one of the steel industry's biggest single customers, the railroad equipment industry. The undoubted testimony of 1926 is that there is a better balance between supply and demand in the steel industry than at any time in years.

If the Steel corporation has erred in its husbanding of resources and in its distribution of profits to stockholders it has been on the side of conservatism. Compared with the much larger distributions made by some smaller and more spectacular companies, the 40 per cent stock dividend is moderate. However, it is exactly in line with the conservative policy which has always marked the 25-year course of the vast enterprise under the guidance of Chairman E. H. Gary.

Boston as a Basing Point

FOR comparisons market prices usually are referred to some definite point, such as important producing or consuming centers. Pittsburgh is the price reference point for steel delivered throughout the East. As for pig iron, convenience has established several basing points such as Buffalo, eastern Pennsylvania and Birmingham. New England is peculiarly situated in that pig iron from different producing districts is offered at about the same delivered price.

When blanket freight rates from various districts were in effect a year ago price comparisons were made on a delivered basis. In the past year a new furnace has been blown in at Troy, N. Y., and the two stacks at Port Henry have been placed in stronger position for New England business. Both of these points take different freight rates to consuming centers in New England, and thus tend to disturb the previous basis of price comparison. Further difficulty has developed through a recent reduction of freight rates from Buffalo, which interferes with blanket rates.

In September the Mystic Iron Works blew in a furnace at Everett, Mass., which is considered as part of Boston for market purposes.

Foreign iron is sold throughout eastern New England on an f.o.b. Boston basis. During the last two years more than 160,000 tons of foreign iron has been brought into Boston.

These new factors make a strong argument for Boston as a future basing point for the New England pig iron market.

Mills Broaden Their Service

OVER the past twenty to thirty years the tendency of steel producers has been toward making themselves self-contained in the distribution of their products. The passing of the large merchant houses, which used to purchase semifinished material from the mills, sell it to rolling mills and take back an equivalent tonnage of finished material, is a phase of this.

A further step now in process is the acquisition or development of warehouses by the primary producers themselves and the building up of

stocks of material of popular dimensions. The mills are thereby enabled to make prompt shipment of a range of sizes whereas without such stock the deliveries wholly are matter of rolling schedules.

That those warehouses operated entirely independent of direct mill connections are continuing to serve a needed purpose is evidenced by their steady expansion. The mills may be expected to overlook no opportunity in pushing sales but the warehouses have an undoubted function as the department store of the industry, and the occasional overlapping in the twilight zone should not work permanent injury to either.

Oil-Electric Crane Is Coming

RESEARCH departments of several crane builders have been engaged in experimental work on motive power and in the near future these experiments doubtless will be productive of a more efficient type. The steam locomotive crane was the first widely used type for outdoor material handling, and its popularity was the lodestone for attracting considerable capital. Later the electrically operated crane found wide use in steel mills, foundries and other industrial plants. Then came the world war and in the wake of the development of the "tank" followed the tractor-type crane which in recent years has made great strides. Today, of the eight leading locomotive crane builders, seven have taken on a line of crawler cranes sa well, while several companies devote themselves exclusively to crawlers.

The most recent development in motive power is the oil-electric engine, in use now on many large railroad systems and at many industrial plants. Realizing the possibilities, crane builders have been devoting considerable time and money in research on this type of power for use in locomotive cranes. From the standpoint of fuel cost the plan is entirely desirable, and from the engineering point of view equally practicable. It appears now to be only a question of time before the first oil-electric locomotive crane is introduced.

Interpretation, Not Gage, at Fault

BECAUSE railroad freight car loadings have not declined in consonance with an apparent easier situation in many lines of industry, some doubt has been cast upon this barometer of business. A perfect gage of business activity has not yet been devised but over a period of years, excepting such emergencies as strikes and car shortages, the number of freight cars loaded and the volume of manufactures have shown a remarkably close relation. It may well be the case at this time that manufacturing as a whole has not eased off to the extent generally believed and the relatively high rate of car loadings should stimulate a better appraisal of the present situation. For one thing, the railroads in recent weeks have been transporting an unusually large volume of commodities for the Christmas trade. In view of the present disinclination of producers, distributors and consumers to maintain inventories or to speculate in commodities, car loadings undoubtedly bear an important relation to current business activities.

What Our Readers Are Thinking

Aiding Michigan Mining Industry

THE importance of the mining industry to the northern peninsula of Michigan is indicated by the fact that it furnishes over half the total income of that portion of the state. Its perpetuation into the indefinite future therefore is a question of prime importance to a large population.

It is in recognition of this importance to a large section of the public that the Michigan College of Mines is asking the state legislature to make an appropriation of $50,000 a year for research in methods of using the low-grade ores of iron and copper.

As to deposits of merchantable iron ore there is reasonably definite information on the quantity available. Some steel companies are provided with known reserves for a generation or more. Others will begin to feel the effects of exhaustion in ten years or less. When the effect of diminishing supply begins to be felt recourse must be had to the iron formation, the rock in which the present ore bodies occur and which itself contains 25 to 35 per cent iron. Of this there are available in the Lake Superior district, according to the estimates of Van Hise, Leith and Mead, the vast total of 60,000,000,000 tons.

The problem of using this iron formation consists in finding ways to get rid of the two chief impurities, oxygen and silica. In iron formation containing 35 per cent iron about 15 per cent is oxygen and 50 per cent is silica, so the most important question is elimination of the silica. This material is by no means uniform in character. One of the first subjects to be studied will be the separation of the silica from the iron oxide. In some phases of the formation the silica and iron oxide are closely intermingled and will be difficult to separate. In other phases the iron oxide occurs in coarser particles. It is with these that successful separation is first likely to be accomplished.

The problem of utilizing the low-grade iron formation can also be attacked along the line of eliminating the oxygen first and then separating the silica from the metallic iron. Both these lines of investigation must be pursued with the purpose of finding the methods of greatest promise economically.—W. O. HOTCHKISS, *president, Michigan College of Mines, Houghton, Mich.*

The Reader's Page

Vol. LXXIX, No. 26 IRON TRADE REVIEW Dec. 23, 1926

Using Steel for Framework of Small Houses

NEW experiences in the use of steel for building small or moderately priced houses are described in the article on page 1616. A Cleveland contractor is using steel for the framework, gypsum or plaster boards for sheathing and brick for exterior finish. Wood is used only for flooring, doors and windows, and support for the roof. A house of this description, with seven rooms and two-car garage has been designed to sell for $20,000 to $25,000. In building a more expensive house the contractor noted excessive shrinkage of the wood, with consequent cracking of the plaster, and he decided to specialize on the use of steel for frameworks to overcome this difficulty, and to increase fireproof qualities. The finished house is as beautiful as one using more wood, and is far more enduring. Steel is steadily finding larger use for house construction.

The "House of Tomorrow" Is Here Today. Page 1616.

Contents

SPECIAL ARTICLES

Casts Iron Pipe in Spinning Green Sand Molds ..... *By Dan M. Avey* 1609
Lowers Cost of Metal Cutting by Preheated Oxygen ..... *By F. P. Wilson Jr.* 1614
The House of Tomorrow—Made Fireproof and Permanent By Steel ..... *By Robert T. Mason* 1616
Analyzes Export Trade Gains ..... *By Dr. Julius Klein* 1619
Watch Your Grinding Costs ..... *By C. C. Hermann* 1620
Bearings Require Clean Steel—I ..... *By John D. Knox* 1622
Industrial Furnaces—Chap. IV Continued ..... *By Charles Longenecker* 1625
Editorials 1629

BUSINESS TREND

Steel Dividend Cheers Sentiment ..... *By John W. Hill* 1632

Barometer of Business 1632
Automobile Production 1633
Business Index 1633
Structural Awards 1634
Coke Production 1634
Foreign Trade 1635
Railroad Earnings 1635

MARKET REPORTS

Review of Markets 1636
Iron and Steel Prices 1637, 1638, 1642, 1651, 1668

Pig Iron 1639
Coke 1640
Ferroalloys 1640
Semifinished 1641
Plates 1641
Iron and Steel Scrap.1643
Sheets 1643
Tin Plate 1644
Pipe 1644
Iron Ore 1645
Bars 1645
Structural Shapes 1646
Reinforcing Bars 1647
Railroad Equipment..1648
Cold Finished Steel ..1649
Nuts, Bolts, Rivets ..1649
Wire and Nails 1649
Nonferrous Metals 1650
Coke By-Products 1650
Warehouse 1651
Pacific Coast Markets 1652
Foreign Markets 1657
Machinery Markets ..1657
Crane Inquiry and Awards 1661

GENERAL NEWS

Industry Pays Tribute to Publisher 1621
Car Builders Are More Hopeful 1654
Industrial Men in the Day's News ..... *Vincent Massey* 1655
Steel Dividend Shows Faith 1659

Men of Industry 1656
Obituary 1660
Here and There in Industry 1662
Construction and Enterprise 1663
Business Changes 1664
Trade Publications ..1666

IRON TRADE REVIEW is published every Thursday by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers, Inc.; and National Publishers Association.

Charles J. Stark .....Editor
Earl L. Shaner .....Managing Editor
John D. Pease .....Advertising Director
Francis F. Light.....Circulation Manager

Branch offices 1037 Old South Bldg., Boston; 1147 People's Gas Bldg., Chicago; 209 Edwards Bldg., Cincinnati; 2203-2206 No. 220 Broadway, New York; 2148-49 Oliver Bldg., Pittsburgh; 24 California street, San Francisco; 1653 Pennsylvania avenue, Washington. Foreign offices: Prince's Chambers, Birmingham, Eng.; 2-8 Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Kurfurstendamm 136, Berlin-Halsensee, Berlin, Germany.

Cable address: *PENTON*, Cleveland; *IROTRAPEN*, London.

Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries, £2:0:0 per year. *Entered at the Postoffice at Cleveland as Second Class Matter.* *Copyright 1926 by the Penton Publishing Co.*

The Business Trend

Steel Dividend Cheers Sentiment

By JOHN W. HILL, Financial Editor

ACTION by the directors of the United States Steel Corp. in declaring a 40 per cent dividend in common stock was easily the outstanding development in the financial world of recent weeks. In general, the distribution was regarded as a distinctly favorable indication for business.

THIS was true because of the indication that the stock dividend means a more liberal policy toward stockholders. That, in turn, implies an expectation on the part of those in control of the great organization of the maintenance of satisfactory industrial conditions. Probably a better average level of earnings for the corporation is expected for the future than in recent years.

THIS expectation appears to be justified by fundamental conditions. The high level of operations held throughout the year, unstimulated by feverish buying or heavy unfilled orders, reflects a more healthy balance of supply and demand for steel. It seems probable that the overhanging margin of excess capacity no longer darkens the horizon of the steel industry. In 1926 the corporation is showing substantially better earnings, due to fuller utilization of facilities and not to higher prices.

THERE is nothing to indicate that the corporation has departed from its course of conservatism. This is the first time it has made an important adjustment of its capital structure. It waited a quarter of a century before capitalizing a portion of its huge accumulated surplus. Stockholders grew restless and somewhat clamorous meanwhile.

THE stock dividend has helped to call attention to the improving outlook for 1927 business. The extreme pessimism prevailing a few weeks ago is much less in evidence. The testimony of industry, itself, is not bearing out signs of a serious decline. IRON TRADE REVIEW'S Monthly Business Index fell but slightly in November, largely from seasonal causes.

THE most serious decline has come from the automobile industry. In November there were 266,000 automobiles and trucks produced in the United States and Canada. This represented a recession of 23 per cent below that of October and one of 30 per cent below that of November, 1925. The decline in November was greater than the usual seasonal falling off for the month.

The Barometer of Business

Industrial Indicators

	Nov., 1926	One month ago	One year ago	1913
Pig iron output (Daily average, tons)	107,900	107,500	100,620	83,900
Blast furnace index 60 per cent—normal	57.7	58.5	57.2	62.8
Unfilled orders (tons)	3,807,000	3,683,000	4,581,780	4,513,000
Ingot output (Daily average, tons)	143,000	157,406	156,116	
Dodge Bldg., awards in 27 states (sq. ft.)	61,037,000	62,828,000	68,299,000	31,250,000
Automobile output	266,000	348,000	377,483	
Coal output, tons	59,700,000	54,000,000	50,723,000	39,869,000
Business failures; number	1,830	1,763	1,672	1,336
Business failures; liabilities	$32,698,000	$33,230,000	$35,922,421	$22,732,000
Cement production, Bbls.	14,193,000	16,596,000	13,639,000	7,704,000
Cotton consumption, bales	583,950	568,532	543,098	438,218
Car loadings (weekly average)	1,068,000	1,189,000	1,023,000	

Foreign Trade

	November	One month ago	One year ago	1913
Exports	$481,000,000	$455,567,000	$447,803,000	$194,000,000
Imports	$376,000,000	$378,247,000	$376,400,000	$149,900,000
Gold exports	$7,727,186	$1,155,584	$24,360,071	$5,234,000
Gold imports	$16,737,800	$8,857,003	$10,456,115	$5,900,000

Foreign Exchange

	Normal	Dec. 22	One month ago	One year ago
Sterling	$4.86	$4.84	$4.84	$4.84
Francs	19.3c	4.00c	3.63c	3.81c
Lira	19.3c	4.15c	4.14c	4.03c
Marks	23.8c	23.70c	23.70c	23.8c

Financial Indicators

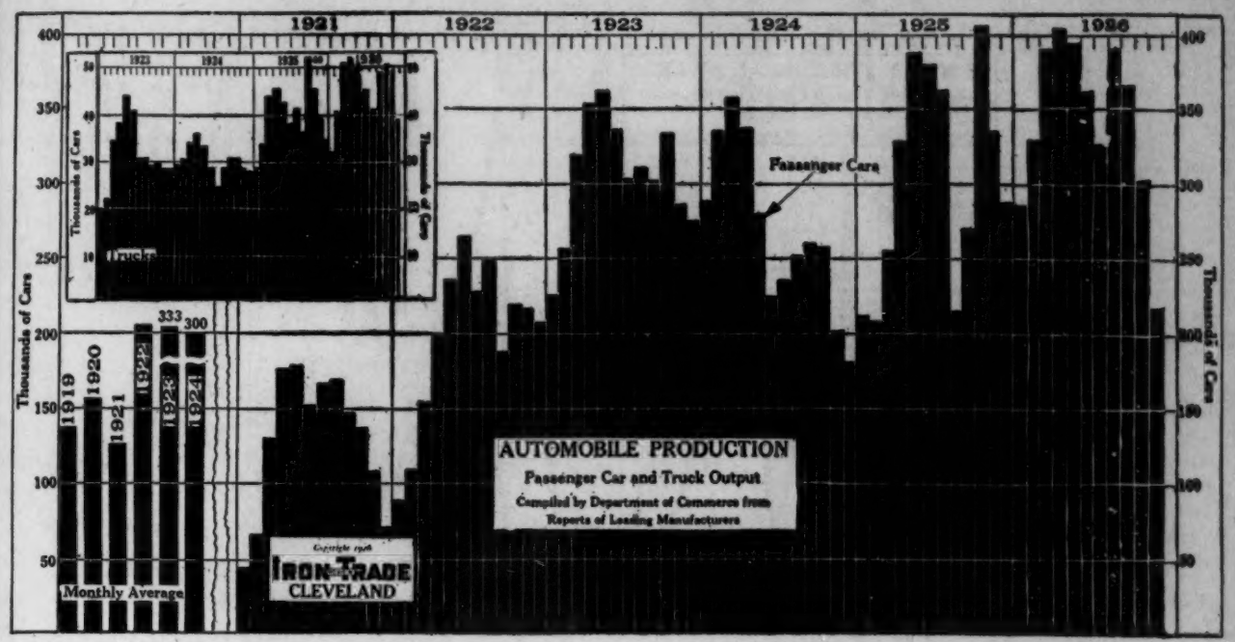
	Nov., 1926	One month ago	One year ago	1913
25 Industrial stocks	**$180.05	$172.63	$176.55	$58.19
25 Rail stocks	**$101.68	$97.08	$93.10	$82.90
40 Bonds	$89.75	$89.01	$85.23	$93.00
Bank clearings (000 omitted)	$41,136,348	$44,905,000	$42,799,439	$13,895,000
Commercial paper rate (N. Y. per cent)	4½-4¾	4½-4¾	4¼	5.60
*Commercial loans (000 omitted)	$8,803,889	$8,798,852	$8,435,708	
Federal reserve ratio, per cent	70	73.8	70	
Railroad earnings	†$146,100,000	$145,000,000	$137,999,000	$59,301,000
Stock sales, N. Y. stock exchange	31,182,620	40,437,374	49,176,979	6,924,000
Bond sales, par value	$276,150,300	$219,671,450	$237,882,000	$41,499,000

*Leading member banks Federal Reserve System.
†October, 1926.
**Dec. 21, 1926.

Commodity Prices

	Dec. 1, 1926	One month ago	One year ago	1913
U. S. Bureau of Labor Statistics	148.1	149.7	157.6	100
Bradstreet's index	138.3	137.9	141	100
Economist's (British)	154	155.9	159	100
Wheat, cash (bushel)	$1.39	$1.39	$1.72	92c
Corn, cash (bushel)	81c	79c	82c	51c
Petroleum, crude (Bbl.)	$3.15	$3.15	$3.65	$2.50

The Business Trend

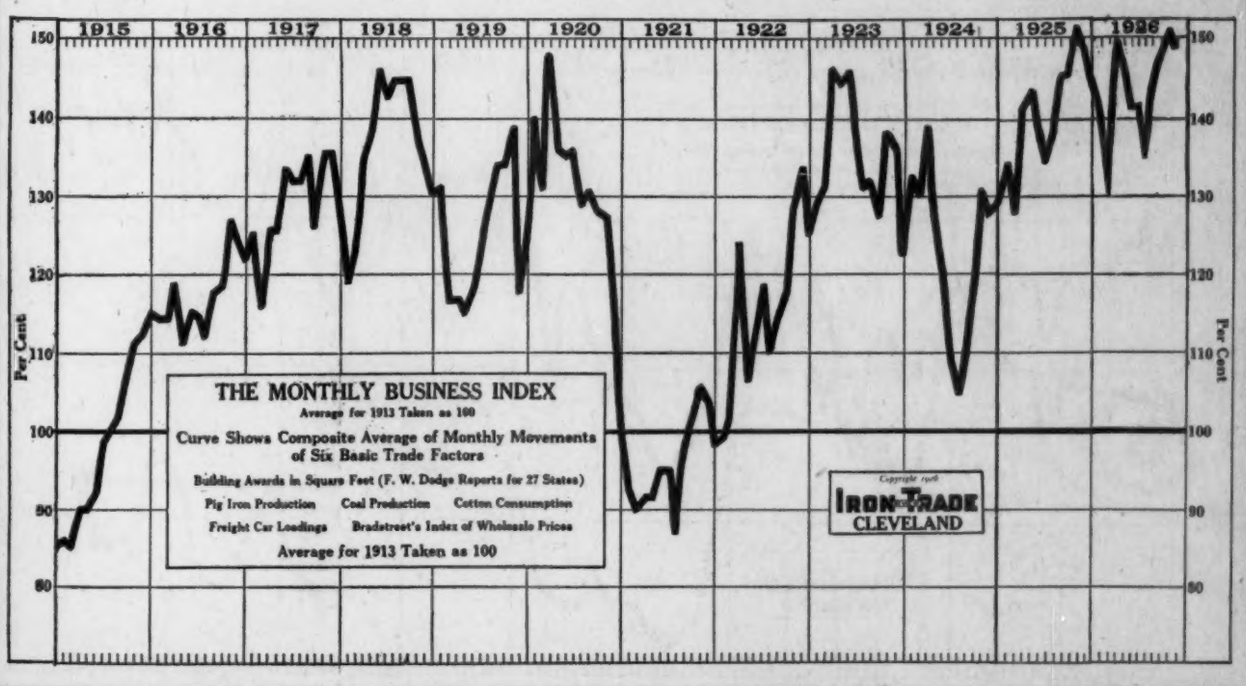


Automobile Production

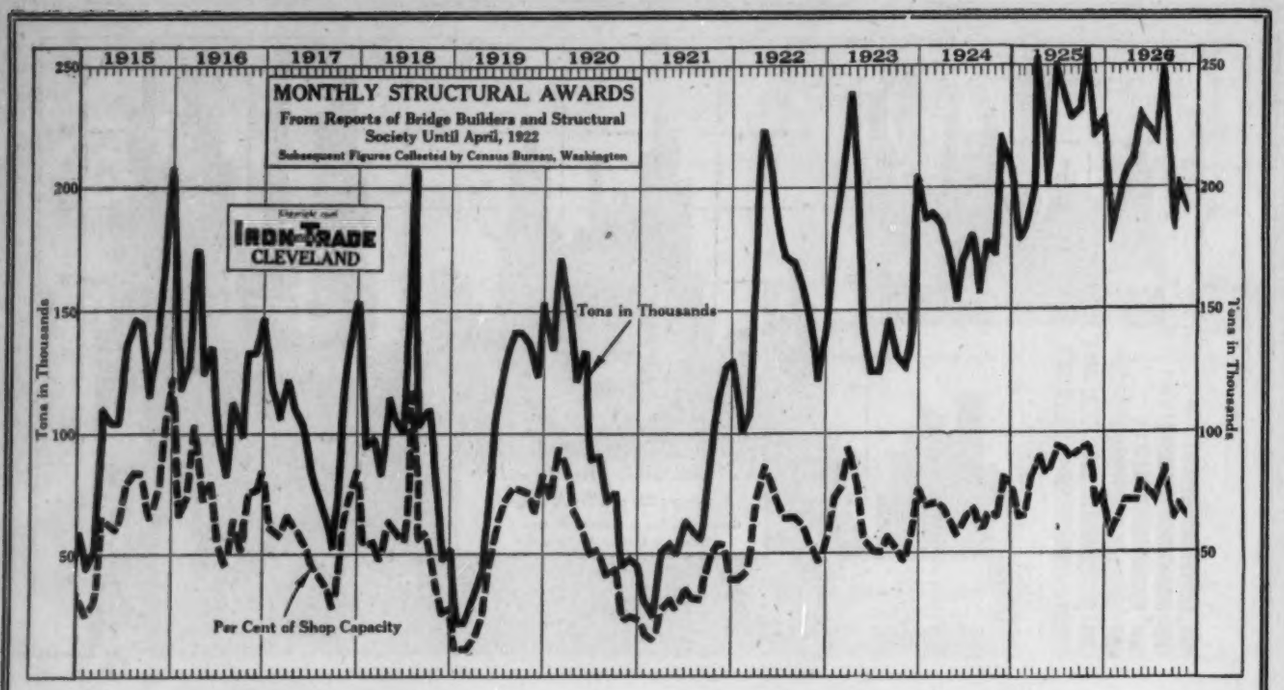
THE estimated output of passenger cars in the United States and Canada for the month was 228,000 compared with 300,000 in October and 363,000 in September. In November 1925 there were 337,435 passenger cars produced in the United States and Canada. The total output of trucks in November was estimated at 39,000 compared with 46,900 in October and 40,000 in November 1925. For the year to date the output of cars and trucks totals 4,280,790 against 4,015,000 in the same period of 1925.

Business Index

IRON TRADE REVIEW'S Monthly Business Index reflects a small seasonal decline in the volume of industrial activities in November. The index stood at 148.2 compared with 151 in October. One year ago in November the index was 149. During the month there were gains for pig iron production, Bradstreet's prices, coal production and cotton consumption. Declines were noted for building and for traffic. Much of the current letdown is traceable to the fact that the present is the height of inventory.



The Business Trend

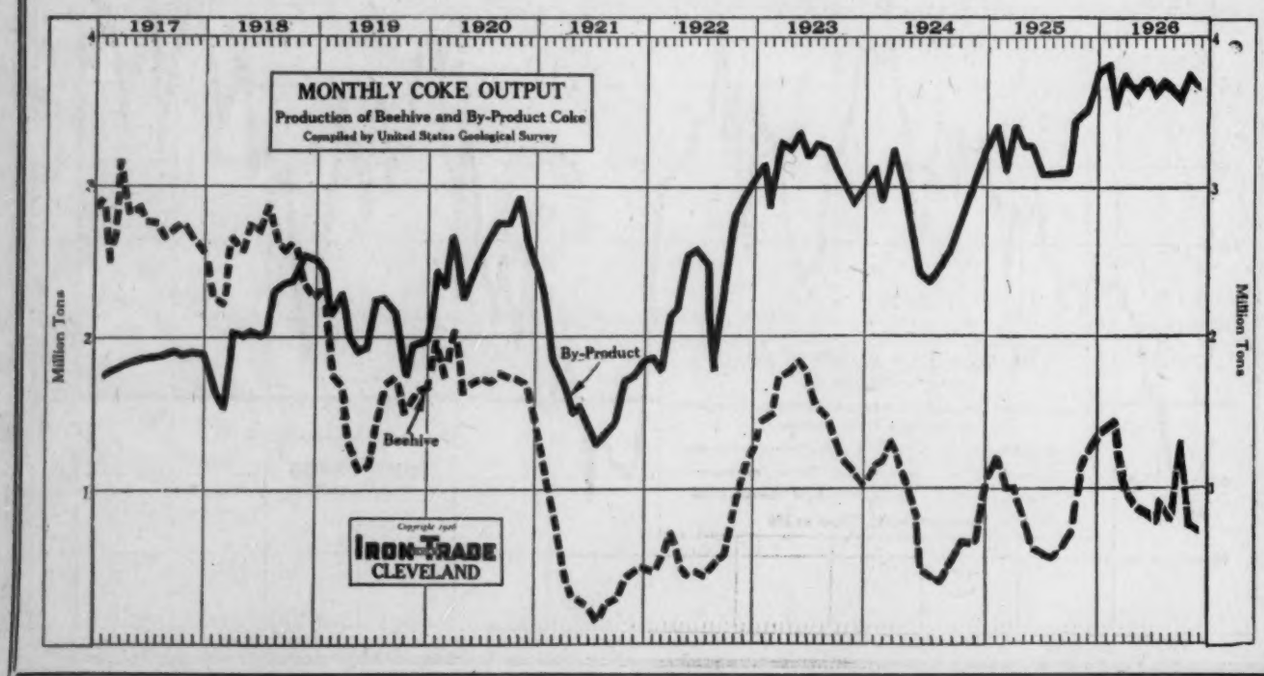


Structural Awards

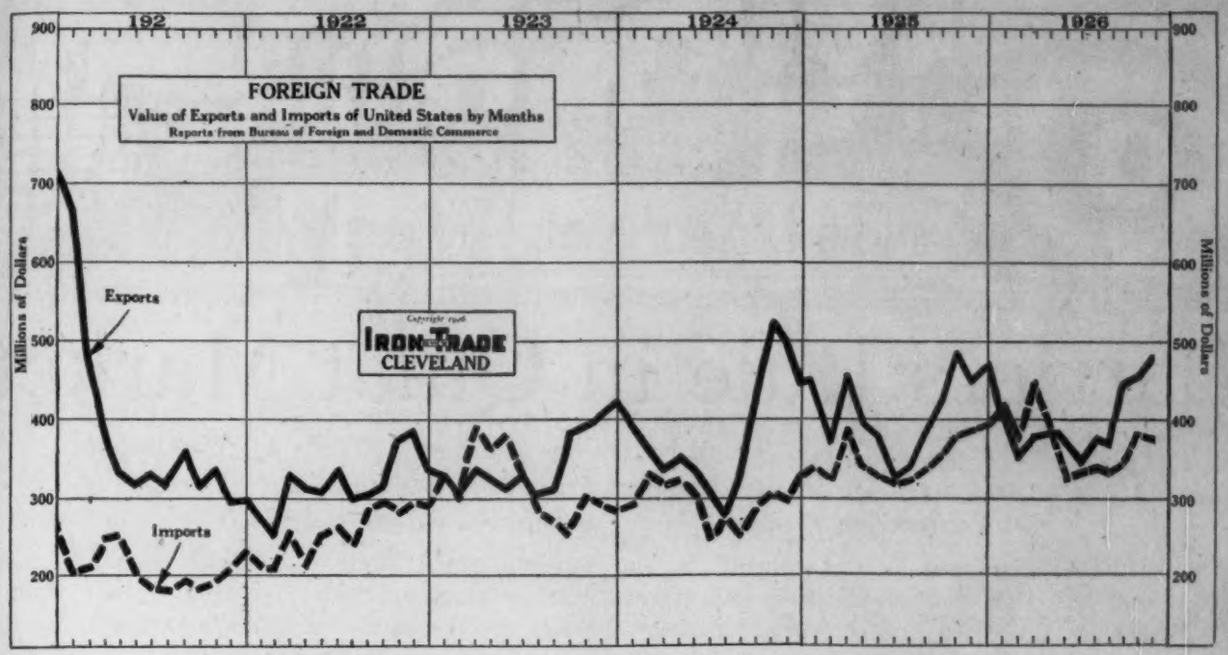
NOVEMBER bookings of fabricated structural steel, as reported to the department of commerce, were 63 per cent of capacity, based on total bookings of 166,505 tons reported by fabricators with a capacity of 263,325 tons a month. The computed tonnage was 192,150 tons. This compares with 201,300 tons in October and with 216,500 tons in November 1925. Shipments of fabricated steel in November were 33 per cent of computed capacity compared with 82 per cent in October.

Coke Production

NOVEMBER'S production of by-product coke declined by 69,000 tons compared with the October total. The decrease was due to the shorter month. The daily rate of output increased to 124,783 tons compared with 122,975 tons in the preceding month. With one exception, this was the highest daily rate on record. Total production in November was 3,743,000 tons. Total production of beehive coke was 859,000 tons a loss of about 1 per cent compared with October.



The Business Trend

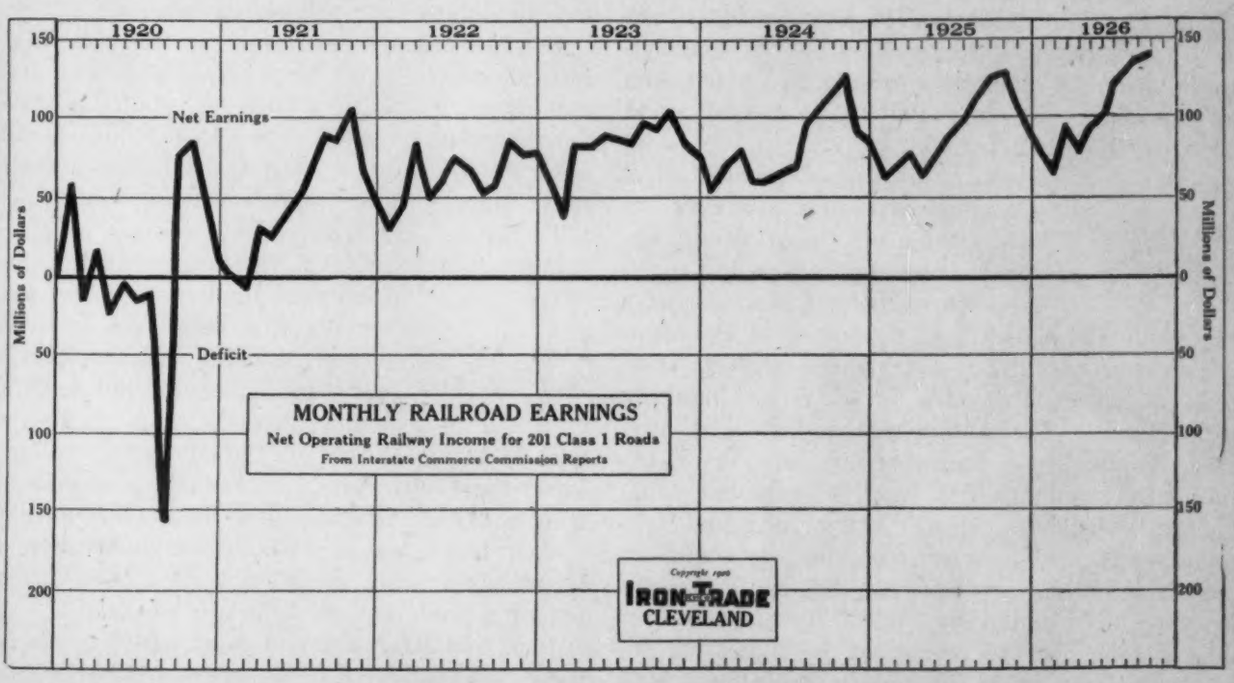


Foreign Trade

EXPORTS of merchandise from the United States in November made a sharp gain to a total of $481,000,000, compared with $455,500,000 in October and with $447,800,000 in November 1925. The value of exports last month was the highest for any month since November 1924. Imports declined to $376,000,000 compared with $378,200,000 in October. They were about the same as the total for November 1925 which was $376,431,000. The excess of exports over imports amounted to $105,000,000.

Railroad Earnings

THE net operating income of class I railroads in October totaled $146,099,000. This compared with $145,000,000 earned in the preceding month and with $137,999,000 in October 1925. The net for October was at the annual rate of return of 4.45 per cent on the property investment of the railroads. During the first 10 months of the year the railroads had a net operating income of $1,035,475,000 which was at the annual rate of return of 5.25 per cent on their property investment.



Carriers Rule in Quiet Market

Place Nearly 35,000 Tons of Track Fastenings at Chicago, While 447,250 Tons of Iron and Steel Are Involved in Cars Placed or Pending—First Quarter Contracting Meager—Some Automotive Orders Released

RAILROAD business is pre-eminent in an iron and steel market which is characterized by the usual pre-Christmas lethargy. Four roads have placed between 30,000 and 35,000 tons of track fastenings at Chicago. Active freight car inquiry now totals 26,700, requiring 400,000 tons of iron and steel products, while the 3150 cars ordered during the week will bring 47,250 tons to the mills.

Car awards include 500 box, 500 hopper and 200 automobile by the Lehigh Valley, 500 stock and 500 auto by the St. Paul, 700 of an unspecified type in a private closing at Chicago and 250 ore by the Chicago & North Western. The latter carrier has come into the market for 120 passenger cars. The St. Paul has withdrawn 500 automobile cars. New inquiry embraces 250 flat, 200 gondola and 150 hopper cars by the Mobile & Ohio. The Illinois Central inquiry for 9200 cars is the largest, followed by 5000 by the Pennsylvania, 3200 by the Missouri Pacific, 3000 each by the Santa Fe and Baltimore & Ohio, and 2500 by the Rock Island.

Contracting Is Avoided

Forward buying of finished steel continues extremely sparing. In fact, producers have never approached so closely to a first quarter with so little of their capacity engaged. Yet a feeling of confidence in the opening months of 1927 is everywhere evident. Car steel ahead of the mills is of record-breaking proportions. The automotive industry is stirring again. These requirements, plus the hand-to-mouth buying which can be expected from general consumers, should bring in round tonnages early next quarter, the mills are confident.

Shipments and new business thus far in December have been under the level of November. Producers appraise this condition as indicating an effort by consumers to reduce inventories and continue short buying, to which users of semi-finished steel are now resorting, rather than a sharp decline in consumption. Demand for fill-in material out of warehouse is running considerably ahead of last December. The mills also have had fair reorders for December shipment.

Auto Industry Gains Felt

The quickening in the automotive industry is reflected in many directions. Several northern Ohio blast furnace interests report pig iron shipments thus far in December in excess of November largely on this account. At Chicago alloy bars for first quarter delivery are more active. The sheet industry in the Mahoning valley has received additional releases from Detroit. Makers of finished steel other than of strip at Pittsburgh are either slightly stepping up their shipments to the automotive industry or will shortly do so.

Beehive furnace coke continues to sink, having lost 25 cents in the past week and now being quoted at $3.25 to $4.25 for spot. Contract figures range from $4.25 to $4.75. More foundry coke contracts have been written for shipment until March 15 at $4.50. The matter of coal mine wages continues a troublesome one, with operators undetermined whether to cut Jan. 1.

Less Inquiry for Pig Iron

Increased inquiry for first quarter pig iron last week proved to be only a bulge and the total has not been augmented nor have any tonnages been closed. Some pressure is being exerted in the Mahoning valley to lower the $19 quotation on foundry and malleable iron to $18.50, which is now the market on basic.

Cast iron pipe at Birmingham is weaker, the larger sizes being quoted now at $36 to $37 per ton or a reduction of $2 in two weeks.

Iron and steel scrap in most districts displays more life and at Pittsburgh an $18 market in

heavy melting steel, or $1 over the current level, is looked for next quarter.

Exports of iron and steel from the United States in November totaled 219,830 tons, a height not reached since January, 1924, and an increase of almost 50,000 tons over October, 1926, and November, 1925.

Over 30,000 tons of steel are required for a western pipe line placed with the National Tube Co.

Weakness in sheets and pig iron has brought another reduction in IRON TRADE REVIEW composite of fourteen leading iron and steel products, which stands this week at $38.12 compared with $38.22 last week and $38.43 last month.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Dec. 22, 1926	Nov. 1926	Sept. 1926	Dec. 1925
PIG IRON				
Bessemer, valley, del., Pittsburgh	$21.76	22.01	19.96	22.76
Basic, valley	18.50	18.75	17.30	20.00
Basic, eastern del., eastern Pa.	22.25	22.50	20.76	23.00
*No. 2 foundry, del., Pittsburgh	20.76	21.36	19.46	22.26
No. 2 foundry, Chicago	21.00	21.00	21.00	25.00
*Southern No. 2, Birmingham	20.00	20.00	20.80	21.60
*Southern Ohio, No. 2 Ironton	20.00	20.00	20.00	21.10
**No. 2X, Virginia furnace	23.00	22.75	23.00	23.30
**No. 2, eastern, del. Phila.	23.26	23.51	22.26	24.26
Malleable, valley	19.00	19.75	17.70	20.50
Malleable, Chicago	21.00	21.00	21.00	23.00
Lake Superior charcoal, del. Chicago	27.04	27.04	29.04	29.04
Gray forge, val., del., Pittsburgh	20.26	21.01	19.11	21.76
Ferromanganese, del., Pittsburgh	104.79	104.79	92.79	119.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	3.25	4.75	3.25	4.00
Connellsville, foundry, ovens	4.50	5.85	4.50	5.10
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	36.00	36.00	36.60
Sheet bars, open-hearth, Pittsburgh	36.00	36.00	36.00	36.60
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.20
Wire rods, Pittsburgh	45.00	45.00	45.00	45.40
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, Philadelphia	2.32	2.32	2.27	2.32
Iron bars, Philadelphia	2.27	2.22	2.22	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Beams, Pittsburgh	2.00	2.00	2.00	1.95
Beams, Philadelphia	2.22	2.22	2.22	2.17
Beams, Chicago	2.10	2.10	2.10	2.10
Tank plates, Pittsburgh	1.90	1.90	1.90	1.90
Tank plates, Philadelphia	2.22	2.22	2.22	2.07
Tank plates, Chicago	2.10	2.10	2.10	2.10
Sheets, black, No. 24, Pittsburgh	3.00	3.10	3.05	3.35†
Sheets, blue anl., No. 10, Pittsburgh	2.30	2.40	2.30	2.50
Sheets, galvanized, No. 24, Pittsburgh	3.85	3.95	3.95	4.60†
Sheets, black, No. 24, Chicago	3.20	3.25	3.15	3.50†
Sheets, blue anl., No. 10, Chicago	2.50	2.55	2.45	2.65
Sheets, galvanized, No. 24, Chicago	4.05	4.10	4.00	4.75†
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago	2.70	2.70	2.70	2.70
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
†Based on No. 28 gage.				
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.00	17.00	17.75	19.00
Heavy melting steel, eastern Pa.	15.75	15.95	16.85	17.65
Heavy melting steel, Chicago	13.00	13.00	14.10	15.50
No. 1 wrought, eastern Pa.	16.00	17.00	17.00	18.75
No. 1 wrought, Chicago	13.75	14.10	14.55	15.40
Rails for rolling, Chicago	16.00	16.50	17.25	18.55

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Dec. 22, 1926)	$38.12
Last week (Dec. 15, 1926)	38.22
One month ago (November, 1926)	38.43
Three months ago (September, 1926)	37.76
One year ago (December, 1925)	39.14
Ten years ago (December, 1916)	53.68
Thirteen years ago (December, 1913)	23.29

Late News Flashes

November Exports Largest Since 1924

Washington, Dec. 21.—November exports of iron and steel from the United States totaled 219,830 tons, the largest since January, 1924. October exports were 170,070 tons and last November 171,134 tons.

Corporation's Ingot Rate Just Above 80

New York, Dec. 21.—Ingot operations of Steel corporation subsidiaries average slightly over 80 per cent. The rate of independent producers is a few points less, with Chicago better than the average and the Mahoning valley under. Many interests will be down from noon of Dec. 24 to the morning of Dec. 27.

Chicago Dips Under 80 Per Cent

Chicago, Dec. 21.—Operations in the district are a little below 80 per cent, plate mill output having been reduced slightly to about 60 to 65 per cent. Active steelworks blast furnaces in the district number 24 out of 36, the leading interest having eight in blast at Gary, six at South Chicago and one at Joliet.

More Automotive Steel Is Released

Pittsburgh, Dec. 21.—Releases are materializing more rapidly on automotive steels. Strip makers do not look for marked improvement until late January but makers of other finished material expect betterment immediately after New Year. Steelmaking here averages 70 to 75 per cent, with the usual holiday curtailment in sight.

Plate and Castings Production Gains

Washington, Dec. 21.—Steel castings bookings in November, totaling 84,685 tons, compare with 72,270 tons in October and 83,197 tons in November, 1925, according to reports to the department of commerce. Fabricated steel plate bookings of 50,819 tons in November, reported by 45 companies, compare with 33,137 tons by 35 companies in October.

Valley Steel Rate Is Down Slightly

Youngstown, Dec. 21.—One less open-hearth furnace is active in the district this week than last, making 28 in all. Carnegie Steel is at 75 per cent of capacity, against 80 last week. Out of 127 independent sheet mills in the district, 97 are running this week, 10 more than last week. Independent bar mills are at 40 per cent and the Carnegie company at 50 per cent. Pipe and skelp mills are unchanged at 70 per cent. Puddling mills are operating at capacity.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30
Chicago	35.00
Forging, Pittsburgh	40.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

Pittsburgh	45.00
Cleveland	45.00
Chicago	46.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	2.00c
Philadelphia	2.17c to 2.32c
New York	2.19c to 2.34c
Chicago	2.10c
Cleveland	2.19c
Birmingham	2.15c to 2.25c

Steel Plates

Pittsburgh	1.90c
Philadelphia	2.22c
New York	2.24c
Chicago	2.10c
Cleveland	2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c
Pittsburgh, cold finishing	2.15c
Pittsburgh, forging quality	2.15c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
*Cleveland, soft steel	2.00c to 2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.90c to 2.00c
Mill, rail steel	1.80c
Philadelphia, common iron	2.22c to 2.32c
New York, common iron	2.24c to 2.34c
Chicago, common iron	2.00c

*The 2.00c price applies to a limited range of forms and sizes.

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh, stamping quality, over 6 in.	2.30c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	3.40c
Worcester Mass	3.90c
Chicago	3.80c to 4.05c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled, Pittsburgh, Chicago carloads	2.30c to 2.40c
Less carload	2.50c to 2.65c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—

2300 (3½ per cent nickel	4.35c to 4.50c
3100 (Nickel chromium)	3.40c to 3.50c
6100 (Chrome vanadium)	4.25c to 4.30c
6100 (Chrome vanad, spring)	3.80c
9250 Silico-mang. spring)	3.20c to 3.25c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	23.00 to 25.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c to 2.90c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.90c to 4.25c
Track bolts, Chicago	3.90c
Tie plates, Chicago, Pittsburgh	2.35c

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.o.b. Cleveland and Pittsburgh base.

Wire nails	2.65c
Galvanized nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c

Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base.

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	3.00c to 3.10c
No. 24, Philadelphia, delivered	3.32c to 3.42c
No. 24, Gary, Indiana Harbor	3.20c
No. 24, Chicago, delivered	3.25c

TIN MILL, BLACK

No. 28, Pittsburgh	3.15c to 3.25c
No. 28, Gary base	3.35c

GALVANIZED

No. 24, Pittsburgh, base	3.85c to 3.95c
No. 24, Philadelphia, delivered	4.17c to 4.27c
No. 24, Gary, Indiana Harbor	4.05c
No. 24, Chicago, delivered	4.10c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.30c to 2.40c
No. 10, Philadelphia, delivered	2.62c to 2.72c
No. 10, Gary, Indiana Harbor	2.50c
No. 10, Chicago, delivered	2.55c

AUTOMOBILE SHEETS

No. 20, Pittsburgh, base	4.25c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.50

Gary, Ind., base 10 cents higher.

Long ternes, No. 24, base	4.30

*This price is subject to quantity differentials established by individual regulations.

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del. 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 2¼ to 3¾-inch	68½
Charcoal iron, 2¼ to 4½-inch	5
Seamless hot rolled 2¼ to 3½-inch	46 off

Further discounts of seven 5 per cents allowed for carloads and six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents allowed.

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$50.20 to 51.20
Six-inch to 24-inch, Chicago	46.20 to 47.20
Over 24-inch, Chicago	45.20
Four-inch, Birmingham	40.00 to 41.00
Six-inch and over, Birming'm	36.00 to 37.00
Four-inch, New York	54.50 to 55.60
Six-inch and over, New York	50.50 to 51.60
Standard fittings, Bir. base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Prices named are for l. c. l. lots. Carloads take an extra 5 per cent off on carriage, machine and plow bolts and lag screws.

*Hot pressed square tapped or blank	$4.00 off list
*Ditto, hexagon	$4.40 off list
*Cold punched square or hexagon blank	$4.10 off list
*Ditto tapped	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

Add 25 cents per cwt. on cold punched and hot pressed nuts.

CARRIAGE BOLTS

(⅝ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅝ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off

Stove bolts, 80, 10 and 5 off in bulk. In packages, 80, 10 and 5 plus 2½ off.

Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000 f.o.b. maker's plant, frt. allowed

	S.A.E. Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	28.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.40c to 2.60c
Structural rivets, c.l., Chi.	2.60c to 2.75c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland, 70, 10 and 5 to 70 and 10 off.

**Rivets, 7/16-inch and smaller, Chicago 70, 10 and 5 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.40 to 6.50 off
Wrought c.l., Pitts. dist.	6.75 to 6.50 off
Lock washers, f.o.b. factory	85 to 90 off

Pig Iron

Shipments Well Sustained—Large Melters Seeking Lower Prices on Recent Inquiries —Sales Small and Slow in Developing

THE brightest feature of the pig iron market is the well sustained rate of shipments. Some important merchant producers say their shipments this month will exceed those of November, and one or two report that their shipments to the automotive industry will be larger than in the prior month. There have been comparatively few requests to delay forwardings, and they have been compensated for as regards tonnage by later releases and some anticipations of January quotas. Several large inquiries issued a week ago have not been closed, and new inquiries issued during the past week were not so substantial. Melters are seeking to lower the price of $19, base, valley, for foundry iron by at least 50 cents on tonnage.

PITTSBURGH, Dec. 21.—Pig iron sales are slow in developing, due largely to uncertain conditions confronting buyers and sellers regarding fuel costs for first quarter. No new negotiations have been started. The Standard Sanitary Mfg. Co.'s inquiries for more than 10,000 tons for various plants, noted last week, still are pending, as are one or two other lots of foundry and malleable iron. Only a few carloads of No. 2 and No. 3 have been sold during the week, at $19, valley, for the base grade. Buyers of larger tonnage are hopeful of developing figures at least 50 cents lower. The American Steel Foundries still is negotiating for 2500 to 4000 tons of basic. A price of $18.50, valley, has been quoted on its inquiry. The Allegheny Steel Co. has not closed on its inquiry for a tonnage of bessemer. The prevailing figure on this grade is $20, valley; confirmed, however, by only one or two carload sales.

Boston, Dec. 21.—Two sales of pig iron, 500 tons each, are noted. Prices are steady. The Everett, Mass., furnace quotes $21.50, base. A sale of No. 2X Buffalo iron was made at $19, furnace, or $23.91 delivered.

New York, Dec. 21.—Sales of pig iron the past week aggregated 3000 to 4000 tons, with active inquiry 2000 to 3000 tons and several good size tonnages for first quarter considered tentatively. Consumers' interest is somewhat improved. Consumption continues to show such vitality that sellers feel cheerful. As a result of recent sales at lower prices the eastern Pennsylvania foundry market now is $22 to $22.50, base, furnace. Buffalo iron continues to be quoted at $19, base, furnace, but recent sales at less have led to a feeling that the $19 price is higher than need be paid on attractive tonnages. Basic iron requirements in southern New England recently were placed for first quarter.

One of the two furnaces of Witherbee, Sherman & Co. at Port Henry, N. Y., is to be blown in the latter part of this week or early next week.

Buffalo, Dec. 21.—Except for an inquiry for 530 tons from the General Electric Co., for an eastern plant, nothing important is pending before pig iron makers. Total inquiry is well under 2000 tons, and sales have been correspondingly small. Low prices recently attributed to Buffalo makers are said to have been withdrawn because of lack of interest of consumers and are not now available.

Cleveland, Dec. 21.—Shipments of pig iron generally to the automobile industry in December are likely to exceed those of November, in the estimation of one large furnace interest. Releases from that source have been more frequent as many plants have completed inventories. Another pig iron producer states this month's total shipments from its furnaces to all users will exceed November's. Some melters have specified on January quotas for shipment this month. Sales of pig iron by furnace companies represented here totaled 15,000 tons for the week, representing moderate size lots. New inquiries are not as large or numerous as a week ago, amounting to about 12,000 tons. A nearby melter seeks 1500 tons of foundry. Large inquiries pending a week ago have not been closed or have been placed elsewhere, including those of Standard Sanitary Mfg. Co. and American Steel Foundries. Prices are steady at $20, base, furnace, for Cleveland delivery, and $19, base, furnace, for outside the Cleveland district.

Chicago, Dec. 21.—While a few inquiries for second quarter pig iron are noted, producers are not seeking the business. Tonnages for shipment immediately after the first of the year are coming out. Most larger melters have filled a part of their first quarter requirements, but a number of smaller foundries have deferred closing. Foundry stocks are low, and melters have had to come into the market for lots of 100 to 350 tons to meet unexpected orders. The largest inquiry in the market is for 3055 tons of basic for an eastern melter. Automotive foundries are awaiting the 1927 car production schedules. The price $21, Chicago furnace, for No. 2 foundry and malleable, is steady but current business is not offering a substantial test.

St. Louis, Dec. 21.—Pig iron sales in the week totaled less than 1200 tons. Inquiry also has dwindled. Job founders in this district report a gain of 15.3 per cent in total sales in November, compared with the month in 1925. Makers of stoves and furnaces also recorded gains. No change in pig iron prices is reported, but the tone of the market is soft.

Birmingham, Ala., Dec. 21.—Bank-

(*Concluded on Page* 1653)

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$20.00
Bessemer, del. Pittsburgh	21.76
Basic, valley	18.50
Basic, del. Pittsburgh	20.26
Basic, Buffalo	**19.00 to 19.50**
Basic, del., eastern Pa.	22.00 to 23.50
Malleable, valley	**19.00**
Malleable, del. Pittsburgh	**20.76**
Malleable, del. Cleveland	20.50
Malleable, Chicago	**21.00**
Malleable, Buffalo	**19.00 to 20.00**
Malleable, del., eastern Pa.	23.25 to 23.75
No. 1X Eastern del., Phila.	**24.26 to 24.76**
No. IX, Buffalo	**20.50 to 21.00**
No. 1 foundry, Chicago	**21.50**
No. 2 foundry, valley	19.00
No. 2 foundry, del. Pittsburgh	20.76
No. 2 foundry, Buffalo	**19.00 to 20.00**
No. 2 foundry, Everett, Mass.	21.50 to 22.50
No. 2 foundry, Chicago	**21.00**
No. 2 foundry, Granite City	**21.00 to 21.50**
No. 2 foundry, Ironton	20.00
No. 2 foundry del., Cleveland	20.50
No. 2 foundry, del., Phila.	22.76 to 23.26
No. 2 foundry, N. J., tidewater	**22.28 to 24.76**
No. 2X, eastern del., Phila	23.26 to 23.76
No. 2X east N. J., tidewater	**22.78 to 25.26**
No. 2X, foundry, Buffalo	**20.00 to 20.50**
No. 2X, eastern del., Boston	25.15 to 25.65
No. 2X, Buffalo, del., Boston	23.41 to 23.91
Continental foundry f.o.b. Boston	21.50 to 22.50
No. 2 Alabama, Birmingham	**20.00**
No. 2 Alabama, del. Cincinnati	**23.69**
No. 2 Tenn., Birmingham base	20.50
No. 2 Tenn., del. Cincinnati	**24.19**
No. 2 Alabama, del. Philadelphia	**26.01**
No. 2 Alabama, del. Chicago	**26.01**
No. 2 Alabama, del Chicago (barge and rail)	**25.18**
No. 2 Alabama, del. Boston (rail and water)	**26.81**
No. 2 Alabama, del. Cleveland	**26.01**
No. 2 Alabama, del. St. Louis	**24.42**
No. 2X Virginia	**23.00**
No. 2X, Virginia, del. Phila.	28.17
No. 2X, Virginia, del. Jers. City	**28.54**
No. 2X, Virginia, del., Boston	28.92
Gray forge, eastern Pa.	22.50 to 23.25
Gray forge, val. del. Pitts.	20.26
Low phos., standard, valley	28.00
Low phos., standard, Phila.	25.76 to 28.29
Low phos., Lebanon	**25.00**
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $25.50; 6 per cent $26.50; 7 per cent $27.50; 8 per cent $28.50; 9 per cent $30.00; 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent$34.00; 11 per cent $36.00; 12 per cent $38.00; 13 per cent $40.00; 14 per cent $42.00; 15 per cent $45.00; 16 per cent $47.00; 17 per cent $49.50.

***Duty paid, delivered Philadelphia consumers. Prices are f.o.b. furnace except where stated otherwise.**

Coke

Wage Factor Unsettles Market —Operators Undecided on Reduction—Market Quiet

UNCERTAINTIES involving the wage situation continue an unsettling factor in the Connellsville coke market. Some quotations are issued on the present basis, while others take into consideration a wage reduction. Operators are undecided about posting notices Jan. 1; steel companies owning coal mines are understood not to favor such a move. Prices fairly steady.

Pittsburgh, Dec. 21.—Spot prices available on beehive furnace coke show a wide range, $3.25 to $4.25. Sales at both these extremes were noted in the last few days, although the minimum represents a sacrifice under distress circumstances. It is out of line with contract quotations, and is below cost of production on the present wage basis. Connellsville operators still are studying the economics of the situation, trying to decide whether to reduce wages Jan. 1. Some are talking about individual interests taking the initiative, though it is understood steel companies owning coal mines do not favor the move. One contract for first quarter closed yesterday was divided by the Central Alloy Steel Corp. among two of three present sources of supply in the Uniontown district. Price details are unavailable. The buyer will use part of the output from its own by-product ovens. Contract figures openly quoted on furnace coke range from $4.25 to $4.75 on the present wage basis, and are considered too high by blast furnace interests. Some are quoted one figure on the present wage basis and another price in case wages are reduced. They are deferring action. Additional foundry coke contracts have been written for shipment until March 15 at $4.50. Others have signed up at $5.50 under the present scale. So-called foundry coke selling below $4.50 involves questionable quality. Preminum brands bring $6.25.

Production of coke in the Connellsville region for the week ended Dec. 11 was 125,990 tons, against 138,650 tons the preceding week, according to the *Connellsville Courier*.

Boston, Dec. 21.—Demand for foundry coke continues fair. Shipments against last half contracts are running close to 90 per cent. The price on contract is unchanged at $13.50, delivered.

New York, Dec. 21.—Coke sellers report that demand is not large but steady. Spot beehive foundry coke is $4.75 to $5.25, Connellsville. Most beehive operators quote $5.25 to $5.50, Connellsville, on beehive foundry coke for first quarter. By-product foundry coke continues unchanged at $10.59 to $11.77, delivered at Newark and other northern New Jersey consuming points.

St. Louis, Dec. 21.—New demand for foundry coke has eased off although shipments on contracts are heavy. Prices are steady.

Birmingham, Ala., Dec. 21.—Reduction of production of coke in this district is not extensive and independent companies are shipping steadily. Better conditions in the market are anticipated within 30 days. All development work, which includes 49 new ovens at Tarrant City and 77 at Fairfield, will be rushed.

Coke Prices

Beehive, Ovens

Prices per net ton	
Connellsville furnace	$3.25 to 4.25
Connellsville foundry	4.50 to 5.50
New River foundry	7.00 to 9.00
New River furnace	6.00
Wise county furnace	5.50
Wise county foundry	6.00
Alabama foundry	5.00 to 6.00

By-Product

Foundry, Newark, N. J.; del.	10.59 to 11.77
Foundry, Chicago, ovens	10.25
Foundry, New England, del.	13.50
Foundry, St. Louis	10.50
Foundry, Granite City, Ill.	10.50
Foundry, Birmingham	5.50 to 6.00
Foundry Indianapolis, del.	10.25
Foundry, Ashland, Ky.	8.00
Foundry, Portsmouth, O.	8.00

Ferroalloys

Users Specifying Heavily on $88 Contracts—Stocks Are Larger

New York, Dec. 21.—Comparatively little additional contracting for ferromanganese for first half has been done the past week. More English ferromanganese has been sold, making a total of about 2000 tons of English ferromanganese placed for delivery in first half. The market continues firm at $100, duty paid, tidewater. Consumers are specifying heavily on their $88 contracts. Indications are stocks are being built up at consumers' plants so that some probably will not have to buy much additional tonnage for first quarter. Spot carloads of spiegeleisen continue to be sold at $37, furnace, for 19 to 21 per cent. A lower price has been named on certain large requirements over the first half.

Many contracts for special ferroalloys for next year have been signed and prices are steady. In some lines there is less of a tendency to contract than last year. Tungsten ore is about $11 a short ton unit, duty paid, with some held higher. The market abroad is not quite so high as a week or two ago, but not much business is going in either market.

Pittsburgh, Dec. 21.—The majority of ferromanganese arrangements for first quarter have been completed at $100, seaboard base, and the market is quiet. Representatives of English producers were notified this week by their principals that $100, c.i.f. Atlantic seaboard, would be the basis for new contracts, but sellers find the market blanketed by domestic producers. Reports that some $88 arrangements are being carried over into 1927 or renewed at that figure are refuted by one or two important producers. Material not specified out this month on requirement contracts will be canceled. In one or two instances where owing to special difficulties shipments cannot be made this month, meager tonnages will be shipped out early in January and billed at $88. Users generally are entering the year with larger stocks than which they started 1926. Most users of 14 to 16 per cent ferrosilicon have contracted, as have buyers of 50 per cent ferrosilicon. Manufacturers using the 10 to 12 per cent grade will continue to buy as needed.

Chicago, Dec. 21.—Ferroalloys are quiet. Little new contracting for ferromanganese is reported, but $100, seaboard, prevails. Some foreign ferromanganese is reported available at New Orleans at $95, seaboard.

Show Fire Brick Cement

In the description on page 1589 of last week's issue of the exhibits of refractories at the power show held in New York, Dec. 6-10, the name of Botfield Refractories Co., 777 S. Swanson street, Philadelphia, was unintentionally omitted. This company displayed an overhung arch to show the holding properties of its high temperature fire brick cement and in other ways demonstrated the advantages of this product for laying up, "facing" and patching brickwork.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater	$100.00
Ferromanganese delivered Pittsburgh	104.79
Spiegeleisen 19 to 21 per cent domestic furnace	37.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrotungsten standard, per pound contained	1.01 to 1.05
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.15 to 3.65
Ferro-carbon-titanium, car lots, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent materials)	122.50

†Duty paid.

Plates

Business Still Moving in Narrow Limits—Slight Improvement Noted

SOME platemakers report a slight improvement in tonnage; demand has not been affected to the usual extent by the approach of the holiday season, in the experience of eastern mills. Contracting for first quarter has not attained extensive proportions. Chicago makers are offering deliveries in one week. Specifications from tank builders comprise most of the demand there.

PLATE PRICES, PAGE 1638

Pittsburgh, Dec. 21.—The majority of steel plate orders are small. Specifications from fabricating shops against contracts are fair. Contracting for first quarter has not reached extensive proportions. The price appears firm at 1.90c, even where competitive figures first appear. Isolated tank orders help smaller shops. A local fabricator received an award in the week involving 1700 tons. Several inquiries for barges, dredge boats, and tow boats are scheduled to be issued after Jan. 1.

Boston, Dec. 21.—December plate sales are running behind November, but the year's total plate business at Boston is fully up to the 1925 record. The price holds firm at 1.90c, Pittsburgh, or 2.265c, delivered.

New York, Dec. 21.—Plate demand does not appear to be affected as much as usual by the approach of the holidays. The mills report fair bookings from this territory in the past week, all for quick shipment. The price is 1.90c, base, Pittsburgh, equivalent to 2.24c, delivered, New York. Oil companies are in the market for spot material, particularly the Sinclair interests. Oil companies generally have not yet taken action with respect to first quarter requirements.

Cleveland, Dec. 21.—December shipments and new business both will not equal November, but one seller has experienced a slight upturn in orders. Larger users have taken out their fourth quarter contract material and some have reordered. Never before have so few first quarter contracts been signed at this date. A fair sized orders for ship repair plates is due shortly. Roxana Petroleum Corp., St. Louis, is reporting planning the installation of 8,000,000-barrel oil storage capacity at Toledo, O., by May 1. Plate makers ask 1.90c, Pittsburgh, or 2.09c, Cleveland.

Philadelphia, Dec. 21.—The seasonal let-down in plate demand is surprisingly small. Consumption continues active, and the price is firm at 1.90c, Pittsburgh.

Chicago, Dec. 21.—Specifications for plates from tank builders comprise the bulk of current business. Some new tank inquiry has appeared from California oil districts, totaling 2000 to 2500 tons. From 1000 to 1500 tons were placed the past week with tank builders for work in the Southwest. Deliveries are much improved, shipments on most sizes being only a week delayed. About 60 to 65 per cent of plate capacity in the district is engaged. To compete with new business in the Southwest producers say it is necessary to quote below 2.10c, Chicago.

CONTRACTS PENDING

1700 tons, tankage for Gulf Refining Co., Girard Point, Philadelphia, various sizes, to Riter-Conley Co.

1500 tons, 600 refrigerator cars for Pacific Fruit Express Co., to Pacific Car & Foundry Co.

400 tons, storage tanks, Phillips Petroleum Co., Panhandle, Tex., to the North American Car Corp.

375 tons, Rockridge siphon, East Bay municipal utility district, Oakland, Calif., to Western Pipe & Steel Co. on lock-bar basis.

130 tons, tank roofs, Sinclair Pipe Line Co., Hamboldt, Kans., to the North American Car Corp.

Appoints Representative

Pittsburgh, Dec. 21.—Superior Steel Corp. has appointed Brace, Mueller, Huntley Inc., Syracuse and Buffalo, as its representatives in New York state, exclusive of New York City. The Superior company will be represented by its new appointee in 10 counties of northern Pennsylvania.

Changes in the Superior Steel Corp. personnel involve the appointment of William P. Ewing as assistant general manager of sales at Pittsburgh, the appointment of Walter G. Blume as sales representative at Pittsburgh, and Reed L. Smith being made assistant sales manager with headquarters in New York under jurisdiction of the Philadelphia office which is in charge of John E. Wetzel.

Charles M. Schwab recently said the best protection against foreign competition is "efficiency and economies on a progressive scale not merely in production but also in marketing methods."

Semifinished

Contracting for Sheet Bars, Billets and Slabs Is Light—Specifications Fair

COMPARATIVELY few contracts have been negotiated for sheet bars and standard billets and slabs for first quarter, users indicating a preference for a month-to-month buying. Some additional contracts for forging billets have been closed at $40, and a few for wire rods at $45. Buyers report makers are holding firmly to $36 for sheet bars and $35 for standard billets.

SEMIFINISHED STEEL PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Sales of semifinished steel are few, and inquiries are scarce. Buyers are working stocks down for inventories, and incentive to purchase ahead is absent. So far this month, specifications have been at a fair rate, but operations among users generally are on a 50 per cent basis, hence, there is not much chance of increased quantities until first quarter. Buyers report steelmakers are firm, $35 applying on 4 x 4-inch rerolling billets and 8 x 2-inch slabs, while $36 still is quoted on small billets and sheet bars. Several additional forging billet contracts for first quarter have been written at $40, and additional specifications have come in from makers of oil well crank shafts. A few sales of wire rods are noted at $45, including some for future shipment. Chain makers have been active in specifying against wire rod contracts. Skelp is no more active than for several weeks past, 1.90c being the usual quotation.

Youngstown, O. Dec. 21.—It becomes increasingly apparent that consumers of sheet bars, billets, etc. are more likely to buy from month-to-month during the first quarter of next year. No contracts have been discussed by consumers lately and they seem reasonably sure the price will not change in the early part of 1927, with sheet bars holding at $36 and billets at $35, Pittsburgh and Youngstown.

Philadelphia, Dec. 21.—Wire rod consumers generally have placed their first quarter contracts at $45, Pittsburgh. Billet buying is light at unchanged prices.

Sanitary Ware Sales Drop

Washington, Dec. 21.—Shipments of enameled sanitary ware in November, reported to the department of commerce by 21 manufacturers, totaled 298,938 pieces, compared with 387,639 pieces in October and 344,076 pieces in November, 1925. Unfilled orders of baths dropped from 43,556 in October to 38,801 in November, while total small ware unfilled orders fell from 105,664 to 97,065.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.00 to 13.50
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	16.50 to 17.00
Buffalo, No. 2	15.00 to 15.50
Chicago	13.00 to 13.50
Cincinnati (dealers)	12.50 to 13.00
Cleveland, No. 1	14.25 to 14.75
Cleveland, No. 2	13.50 to 14.00
Detroit	12.50 to 13.00
Eastern Pennsylvania	15.00 to 15.50
Bethlehem delivery	15.00 to 15.50
New York (dealers) (yard)	9.25 to 9.75
Pittsburgh, No. 1	16.75 to 17.25
St. Louis	13.00 to 13.50
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo	15.00 to 15.50
Chicago	11.50 to 12.00
Cleveland	13.00 to 13.50
Detroit	11.00 to 11.75
Pittsburgh	15.50 to 16.00
Valleys	15.00 to 15.50

BUNDLED SHEETS

Buffalo	11.00 to 11.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00 to 13.50
Pittsburgh	14.50 to 15.00
St. Louis	8.50 to 9.00

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	6.00 to 6.50
Detroit	8.00 to 8.50
St. Louis	9.00 to 9.50

STEEL RAILS, SHORT

Birmingham	12.50 to 13.50
Buffalo	17.00 to 17.50
Chicago	16.75 to 17.00
Cincinnati (dealers)	17.00 to 17.50
Cleveland (over 6 ft.)	14.75 to 15.00
Detroit	13.00 to 14.00
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	13.00 to 13.50
Buffalo	14.25 to 14.75
Chicago (net)	14.00 to 14.50
Cincinnati (dealers) (net)	8.50 to 9.00
Cleveland	11.00 to 11.50
Detroit (net tons)	11.50 to 12.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	10.00 to 11.25
Pittsburgh	13.00 to 13.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	18.00 to 18.50
Cincinnati (dealers)	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
Pitts. billet and bloom crops	21.00 to 21.50
Cleveland, billet and bloom crops	18.00 to 18.50

SHOVELING STEEL

Chicago	13.00 to 13.50
Pittsburgh	12.50 to 13.00
St. Louis	13.00 to 13.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.00 to 18.00
Pittsburgh	18.50 to 19.00
St. Louis	14.50 to 15.00

FROGS, SWITCHES, GUARDS

Chicago	14.50 to 15.00
Eastern Pennsylvania	15.00 to 16.00
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	15.00 to 15.50
St. Louis	13.75 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	12.00 to 12.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	15.00 to 15.50
Chicago, No. 1	13.75 to 14.00
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York, No. 1 (dealers)	14.50 to 15.00
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	17.00 to 17.50
St. Louis, No. 1	12.00 to 12.50
St. Louis, No. 2	13.00 to 13.50

WROUGHT PIPE

Boston (dealers)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Buffalo	15.00 to 15.50
New York (dealers)	9.25 to 9.75

YARD WROUGHT

Boston	11.00 to 11.50
Eastern Pennsylvania	16.50 to 17.00

BUSHELING

Buffalo	15.00 to 15.50
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	8.00 to 8.50
Cleveland No. 1	11.75 to 12.00
Cleveland, No. 2	11.00 to 11.25
Pittsburgh, No. 1	14.25 to 14.75
St. Louis, No. 1	11.50 to 12.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston	8.00 to 8.50
Buffalo	10.00 to 10.50
Chicago	7.25 to 7.75
Cincinnati (dealers)	6.00 to 6.50
Cleveland	9.00 to 9.25
Detroit	7.50 to 8.00
Eastern Pennsylvania	13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.00 to 12.50
St. Louis	7.00 to 7.50

CAST IRON BORINGS

Birmingham (chemical)	15.50 to 16.00
Birmingham (plain)	8.00 to 8.50
Boston Chemical	10.00 to 10.50
Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	9.50 to 10.00
Cincinnati (dealers)	6.00 to 6.50
Cleveland	11.00 to 11.50
Detroit	9.00 to 9.50
Eastern Pennsylvania	13.00 to 13.50
Eastern Pennsylvania (chem.)	15.50 to 16.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00
St. Louis	10.00 to 10.50
Valleys	13.50

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	7.50 to 8.00
Buffalo	12.00 to 12.50
Cincinnati (dealers)	5.50 to 6.00
Cleveland	11.00 to 11.50
Detroit	8.50 to 9.00
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00

PIPES AND FLUES

Chicago (net)	8.25 to 8.75
Cincinnati (dealers)	7.50 to 8.00
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago (net)	13.25 to 13.75
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	11.25 to 12.00
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	8.00 to 8.50
Buffalo	13.00 to 13.50
Chicago	9.25 to 9.75
Cleveland (over 10 in.)	11.50 to 12.00
Detroit	10.00 to 10.50
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	8.00 to 8.50
Chicago	17.00 to 17.50
Eastern Pennsylvania	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago (net)	19.00 to 19.25
St. Louis	19.50 to 20.00

Iron Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	12.75 to 13.25
Cleveland	12.00 to 12.50
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	14.50 to 15.00
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	18.00 to 18.50
Buffalo	16.50 to 17.00
Chicago	18.75 to 19.25
Cleveland	16.00 to 16.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	23.00 to 24.00
St. Louis	19.00 to 19.50

SHAFTING

Boston (shipping point)	16.00 to 17.00
Chicago	18.25 to 18.75
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	17.50 to 18.00
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	15.00 to 16.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	16.00 to 16.50
Buffalo, steel	17.00 to 17.50
Chicago, iron	14.75 to 15.25
Chicago, steel	16.50 to 17.00
Cincinnati	11.50 to 12.00
Eastern Pennsylvania	16.50 to 17.00
New York iron (dealers)	12.50 to 13.50
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	18.50 to 19.00
St. Louis, iron	14.00 to 14.50
St. Louis, steel	15.00 to 15.50

NO. 1 CAST SCRAP

Birmingham, cupola	16.00 to 17.00
Boston	18.00 to 18.50
Buffalo	15.00 to 15.50
Chicago, No. 1 machinery	18.50 to 19.00
Chicago, No. 1 railroad or agricultural	17.50 to 18.00
Cincinnati No. 1 machinery cupola (net tons dealers)	17.00 to 17.50
Cleveland, cupola	15.00 to 16.00
Detroit (net tons)	13.75 to 14.25
Eastern Pennsylvania, cupola	17.00 to 18.00
New York, cupola (dealers)	14.50 to 15.00
Pittsburgh, cupola	16.00 to 16.50
San Francisco, delivered	20.00 to 21.00
Seattle	16.50
St. Louis, railroad	16.00 to 16.50
St. Louis, agricultural	16.00 to 16.50
St. Louis, machinery	19.00 to 19.50
Valleys	17.50

HEAVY CAST

Boston	15.50 to 16.00
Buffalo (breakable)	13.25 to 13.75
Cleveland	12.00 to 12.25
Detroit (automobile) (net tons)	14.50 to 15.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.50
Pittsburgh	15.00 to 15.50

MALLEABLE

Boston, railroad	19.00 to 19.50
Buffalo	17.00 to 17.50
Chicago, agricultural	15.25 to 15.75
Chicago, railroad	16.00 to 16.50
Cincinnati, railroad (dealers)	14.00 to 14.50
Cincinnati, agricultural (dealers)	13.00 to 13.50
Cleveland, agricultural	15.50 to 16.00
Cleveland, railroad	17.00 to 17.50
Detroit	14.00 to 14.50
Eastern Pennsylvania, railroad	14.00 to 15.00
Pittsburgh, railroad	17.00 to 17.50
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	14.00 to 15.00
Boston (dealers)	11.50 to 12.00
Buffalo	17.25 to 17.75
Chicago	16.00 to 16.50
Cleveland	14.50 to 15.00
Eastern Pennsylvania	17.00 to 17.50
New York	13.75 to 14.25
Pittsburgh district	18.00 to 19.00
St. Louis	15.25 to 15.75

LOCOMOTIVE TIRES

Chicago, No. 1	17.75 to 18.00
Chicago, cut	17.00 to 17.50
St. Louis, No. 1	16.25 to 16.75

LOW PHOSPHORUS PUNCHINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh	18.00 to 19.00

Scrap

Signs of Renewed Interest Appear Though Buying Is Still in Small Lots

WHILE no positive development has appeared in the scrap market undoubted signs of a revival are discernible. Railroad lists at Chicago brought prices above the current level and in eastern centers some buying has been done, partly under cover, indicating renewed interest. In general the surface situation and prices remain unchanged and nominal.

Chicago, Dec. 21.—Sentiment in the iron and steel scrap market is more cheerful, but transactions are chiefly short covering by dealers. Slight tendency to speculate on railroad offerings is appearing, but consumers of steelworks scrap remain out of the market entirely. A few foundry melters are taking only piecemeal tonnages. Heavy melting steel in the Santa Fe list, which closed last week, sold at $13.75, delivered, while steel angle bars brought $15.75, gross delivered, and No. 1 railroad cast closed at $16.20, net, delivered. Railroad malleable sold at $16.65, gross delivered, and No. 1 wrought at $12.85, net delivered. Similar prices were bid for the Rock Island's scrap.

New York, Dec. 21.—While fresh consuming demand is lacking, the scrap market is being sustained by orders against contracts. The situation, however, is weak, and it appears likely the next tests will lead to concessions. Bethlehem Steel Co. has placed an embargo on shipments to Steelton, Pa., and Sparrows Point, Md., as material is coming out in too great volume to handle.

Philadelphia, Dec. 21.—Several lots of heavy melting steel have been placed by eastern mills, fully 10,000 tons. Some of this was bought at $16 for strictly No. 1. It is difficult to obtain much scrap of this grade for less. Plenty of scrap is available since heavy shipments have caused Bethlehem to place an embargo at Steelton and Sparrows Point. Considerable turnings and bundled sheets have been sold the past week and a fair business has been done in cupola cast.

Buffalo, Dec. 21.—While dealers say the scrap market is quiet there are persistent reports of recent sales of No. 1 heavy melting steel at $16.50 to $17. These reports have resulted in upward adjustment of the nominal prices prevailing here. There is no open inquiry for ordinary heavy melting steel or other materials, with sales confined to small lots exclusively.

Pittsburgh, Dec. 21.—Lack of buying and lowered operations generally among consumers seems not to have had the usual weakening effect upon prices of iron and steel scrap. Good scrap remains scarce and an $18 market on heavy melting steel seems assured early in the first quarter. At the moment, $17 is the minimum on first quality scrap and tonnage buyers would have difficulty finding quantities even at that figure. In fact, it is understood that one sale at $17.25, recently noted, was arranged at that figure only because the buyer agreed to take in No. 2 steel at a stated differentials. Next sales are expected to develop $17.50 or higher.

Cleveland, Dec. 21.—Consumers of scrap here and in the Valleys are buying nothing and continue to hold up shipments on contract. This condition seems likely to continue to the end of the year. Prices are largely nominal. Production has not been large and there seem to be no accumulations in the district to weigh the market down.

Boston, Dec. 21.—Steel scrap prices are spotty. A Connecticut consumer took several cars at $12.50 delivered. Other sales as high as $11 shipping point are reported in the Boston district. The American Steel & Wire Co. at Worcester, Mass., is temporarily out of the market, and other large consumers seem inclined to wait until after the first of the year.

St. Louis, Dec. 21.—Iron and steel scrap continues at a standstill. Aside from a few scattered car lots and the purchase of a small tonnage of steel by an East Side melter, nothing has been done. Dealers are more cheerful than heretofore, and look for a buying movement shortly after Jan. 1. There was a sharp drop in railroad offerings.

Birmingham, Ala., Dec. 21.—Quotations on iron and steel scrap are low and uncertain and new business is in small lots. Movement of heavy melting steel on contracts is steady as consumption continues.

Sheets

Black and Galvanized Prices Are Easier—Larger Releases Expected Toward Close of Year

SHEET consumers have close contact with mills, and while the usual seasonal suspensions are noted larger releases are expected before Jan. 1. A Detroit motorcar manufacturer is specifying heavily for early January shipment. Small orders are the rule and keen competition has forced concessions in prices of black and galvanized material. Operations are slowing up.

SHEET PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Sheet makers note the usual end-of-the-year suspensions. While this is interfering with operations, it is no more than expected at this time. Numerous releases, however, are expected the last few days of the year. Occasional orders involving several hundred tons at a time are placed. One or two orders for blue annealed sheets involving a trifle less than 1000 tons each were closed in the past week, and also a few galvanized of similar size. Additional contracts have been written for first quarter involving 12,000 to 15,000 tons, but the majority of users prefer to buy on a month-to-month basis. The orders referred to were taken at the maximum market figures. Open market competition, however, is extensive on black, a little less extensive on blue annealed, and even less so on galvanized. This is interfering with the liberal placing of orders which makers might expect if the market was firmer. One or two cases where black sheets were quoted at 2.90c or 2.95c, developed some special features, the usual price cut being $2 per ton, the stopping point for the majority of the companies offering price cuts. Operations receded last week, the American Sheet & Tin Plate Co. going to 70 per cent, and independents averaging about that rate.

Boston, Dec. 21.—Sheet prices at Boston are less firm. Galvanized sheets have sold at 3.85c, Pittsburgh, and black sheets at 3.00c. Current sales have declined from 15 to 25 per cent below sales of the previous week. Inquiry is fair.

Youngstown, O., Dec. 21.—An important Detroit automobile builder that recently contracted for its first quarter requirements of sheets with several makers has specified deliveries for all the quantities in the first three weeks of January, thus indicating it may require more sheets in the period. Ten more sheet mills than operated last week resumed in this district Monday, this including resumption by two small mills idle previously. Releases on considerable tonnages of full-finished and black sheets dated Dec. 27 are being received, and general resumption of most mills appears probable in the opening week of January with increasing schedules indicated for each succeeding month through March. Valley mills appear to have adopted the same schedule of shutting down Friday noon preceding Christmas and

New Year's, resuming on the following Monday.

The usual price of No. 24 gage black sheets is 3.10c, but 3.00c, Pittsburgh, still is available. Galvanized can be had at 3.85c, but most makers insist their price is 3.95c. Full-finished holds at 4.25c. Blue annealed ranges from 2.30c to 2.40c, Pittsburgh.

New York, Dec. 21.—A few new orders for sheets have been placed for early shipment. Indication are considered fair for active consumption after the inventory period. Consumers are showing no disposition to hurry their contracts. The market on black sheets generally is 3.00c, base, Pittsburgh, and on galvanized sheets 3.85c, base, Pittsburgh. On blue annealed sheets 2.25c, base, Pittsburgh, has been done, but as a rule the minimum is 2.30c. A portion of the business continues to come in at 2.40c, generally small lots. Orders have been placed here for 1030 tons of car repair sheets for the Imperial Government Railways of Japan by Mitsui & Co. with United States Steel Products Co. and American Rolling Mill Co. The Shibaura Engineering Works is in the market for 400 tons of electrical sheets.

Chicago, Dec. 21.—Lighter gages of black and galvanized sheets are in more demand than the heavier gages, and specifications for blue annealed are light. With backlogs being reduced deliveries are improving and shipments on most gages can be made in ten days. Mills have been operating steadily the past few days at 75 to 80 per cent of capacity. Inland Steel Co. will start installation of its new sheet bar mill after Jan. 1. This mill will provide for the rolling of lighter sizes of sheet bars and will furnish greater flexibility in sheet bar output. Prices are steady.

St. Louis, Dec. 21.—Sheet buyers are postponing purchases until after inventories have been completed, and specifications are slow. Galvanized material is more active than other grades. Prices remain quotably steady, but some concessions have been made to permit the reduction of heavily stocked sizes.

Philadelphia, Dec. 21.—Sheet demand continues to decline. All mills need business. Eastern producers are operating at 50 to 75 per cent. Prices usually are 3.00c, Pittsburgh on black; 3.85c on galvanized and 2.30c on blue annealed, although 2.25c occasionally is done.

Cleveland, Dec. 21.—Spottiness continues to characterize the local sheet market. Demand generally continues to ease off but in a few instances sellers report considerable first quarter contracting. In some cases these contracts are larger than those for fourth quarter needs. Although most sellers are naming 3.10c, Pittsburgh, as their first price on black sheets, No. 24 gage, 3.90c is the contracting level and the market for most tonnage being booked. Lower quotations have been named by some small mills. Blue annealed demand is better and 2.30c. Pittsburgh, is a firm minimum of the 2.30c to 2.40c spread. Galvanized sheets are steady at 3.85c with little demand. Autobody sheets are unchanged at 4.25c, Pittsburgh.

Tin Plate

Users Taking Material—Operations Continue at High Rate

TIN PLATE PRICES, PAGE 1638

Pittsburgh, Dec. 21.—The majority of tin plate consumers are taking the material as rolled, and are not asking producers to carry the stocks until after the holidays. Only a few are doing the latter but their tonnage will be released the latter part of the month or early in January. At 11 plants of the American Sheet & Tin Plate Co., practically full operations have been maintained all year. Since the first of this month it has had its 13 plants running 100 per cent, the past week having witnessed only a lapse of one-tenth of 1 per cent due to one tin mill being down two days. The company commenced this week at 100 per cent and is fully confident of finishing the year on practically that basis. Holiday celebrations may interfere slightly. Independents do not have such large backlogs but are likewise in a favorable position as regards prospects for 1927. The open market figure still is $5.50.

New York, Dec. 21.—Kyodo Oil Co. of Japan has placed orders covering its forward tin plate requirements. Mitsui & Co. will supply 10,000 boxes and Suzki & Co., 7000 boxes. It is expected the business will be placed in this country.

Philadelphia, Dec. 21.—Large tin plate consumers in this district have placed contracts for first quarter and first half. A fair amount of selling from stock lists is noted at $4.75 and $5, Pittsburgh.

Industrial employment in Illinois dropped 1.03 per cent from Nov. 2 to Dec. 21, according to the Illinois department of labor. Metal industries of the state failed to show the usual November pick-up.

Pipe

Mill Backlogs Diminishing as New Business Lags—Cast Pipe Activity in East Improves

BACKLOGS of tubular products mills are being lowered as shipments continue to exceed orders. New business is slow in developing, although several large oil country line pipe projects are in contemplation. Cast pipe is more active, especially in the East where Boston is reported to have placed 5000 tons and three pending projects require 15,000 tons.

PIPE PRICES, PAGE 1638 AND 1668

New York, Dec. 21.—Private inquiry continues to dominate cast pipe market, and of approximately 20,000 tons involved in four large inquiries, approximately 5000 tons has been placed. This demand is all for spring delivery. With the exception of one or two lots involving 500 tons or so, municipal inquiry is at a standstill. Prices continue easy. While the market on 6-inch and over is quoted at $50.50 to $51.60, the inside figure is the more representative. Four-inch pipe may be quoted at $54.50 to $55.60.

The gas companies of Japan are in the market for their pipe requirements. Toho Gas Co. is taking bids on 430,000 feet of galvanized gas pipe. Tokio Gas Co. is in the market for 352,000 feet of black gas pipe.

Pittsburgh, Dec. 21.—Deliveries of lapwelded pipe grow easier as makers are catching up on their orders. At no time have backlogs been considered large, but at certain periods individually large orders have tied up certain equipment so that deliveries of stated sizes were deferred as much as eight weeks. At present, however, deliveries of the more popular sizes of line pipe can be had within two to six weeks. Buttweld pipe can be shipped out of stock, mill reserves being heavy. Large producers state that the Amarillo gas line to Denver is still "on paper." Quotations are firm and it becomes apparent that jobbers are maintaining a stronger price position than at any time in the past year.

National Tube Co. has taken an order for 300 miles of 10-inch line pipe from the Humble Oil & Gas Co. for the line running out of the Texas Panhandle. Between 30,000 and 40,000 tons of steel are involved.

Chicago, Dec. 21.—Attractive tonnages of cast iron pipe for winter delivery are quoted at $38, base, Birmingham, for 6-inch and over. While some business has been placed as high as $39 and over, the bulk of current tonnage is at $38 to $39, Birmingham. National Cast Iron Pipe Co. is reported low bidder on 1100 tons of 6 to 12-inch pipe for North Riverside, Ill.

Birmingham, Ala., Dec. 21.—The cast iron pressure pipe market is still soft. A few lettings for more than 500 tons each have been reported lately but there is no change in general conditions. Quotations are $36 to $37 for 6-inch and over pipe as established last week. Pipe shops will cease operations for a week to 10 days each for the hoildays and repairing.

The Market Section

CONTRACTS PLACED

5000 tons, Boston Consolidated Gas Co., Boston, reported placed.
1480 tons, 4 to 24-inch class B, Sacramento, Calif., to National Cast Iron Pipe Co.
500 tons, 8-inch class C, Seattle, to American Cast Iron Pipe Co.
400 tons, 6-inch, Glenview, Ill.; to National Cast Iron Pipe Co.
258 tons 2 to 8-inch class B, San Luis Obispo county water district No. 2, San Luis Obispo, Calif., to unnamed interest.
240 tons, 10-inch pipe for Sacramento, Calif., to American Cast Iron Pipe Co.
150 tons, 20-inch deLavaud pipe, Sacramento, Calif., to United States Cast Iron Pipe & Foundry Co.

CONTRACTS PENDING

6000 tons, Brooklyn Union Gas Co., Brooklyn, N. Y.; early action expected.
5000 tons, United Gas & Improvement Corp., Philadelphia; pending.
4000 tons, chiefly 6 and 8-inch pipe for Consolidated Gas Co., New York; action expected shortly.
3650 tons, 4 to 24-inch class B, Portland, Oreg.; bids in Jan. 3.
1700 tons, 6 to 24-inch pipe for Minneapolis; bids opened Dec. 23.
1200 tons, Huntington Park, contractors letting awarded to Geo. Mitchell Co., 619 West Belgrave street, Huntington Park.
1118 tons, 8 to 20-inch class B and D, Glendale, Calif.; bids opened.
700 tons, 12-inch pipe, for Macomb, Ill.; bids opened Dec. 28.
542 tons, 6 and 12-inch class B, Spokane, Wash.; bids opened.
500 tons, 6 and 16-inch pipe, Hyland Park, N. J.; contract bids asked.
409 tons, 4 to 12-inch class B, Bellingham, Wash.; bids in Jan. 6.
204 tons, 8-inch class B, Redwood City, Calif.; bids opened.

Iron Ore

Early Interest in Market Indicated—November Consumption Drops

Cleveland, Dec. 21.—The market for Lake Superior iron ore is quiet. Inquiries for 1927 have not appeared, but some producers report consumers are showing interest earlier than usual. Shippers hope for an advance in price. Consumption of Lake Superior iron ore in November was 230,553 tons less than in October. Following are further comparisons:

	Tons
Ore consumed in October	4,947,539
Ore consumed in November	4,716,986
Decrease in November	230,553
Ore consumed in November, 1925	4,554,377
Ore at furnaces Dec. 1, 1926	35,098,164
Ore on Lake Erie docks Dec. 1, 1926	7,662,800
Total at furnaces and Lake Erie docks Dec. 1, 1926	42,760,964
Total, Dec. 1, 1925	41,685,888

The Lake Superior Iron Ore association has revised its statement of ore shipments for the season by the vessel route, the total now being given as 58,537,855 tons, 338 tons less than reported in the former statement.

Manganese Ore Quiet

New York, Dec. 21.—Brazilian manganese ore has been offered recently at about 36c per unit, c.i.f. tidewater. There have been no recent sales and there is not much interest in manganese ore at this time.

Bars

Specifications Are Better as Year Nears Close—Buying for First Quarter Continues Light

BETTER demand for steel bars is developing and specifications have been excellent, Chicago makers receiving more in December than for all of November. Consumers find they need more than they had estimated for current operations and are asking quicker shipments. Production is not at a high point and prices are steady at the prevailing level.

BAR PRICES, PAGE 1638

Chicago, Dec. 21.—Specifications for soft steel bars and other finished steel for delivery at the end of this month have been stepped up, indicating that a number of buyers have been pinched by lean stocks as they have prepared to face the new year. Iron and steel jobbers in territory tributary to Chicago are finding their late season business picking up. These factors have contributed to increased specifications, which now are slightly in excess of shipments. Bar specifications this month have passed the November mark. Practically no forward buying is in evidence in soft steel bars, and mills are not encouraging formal contracting. Prompt delivery is assured for round tonnages of bars.

Alloy steel bars have been stimulated by automotive interests. Automotive plants are doing some forward buying, which has tended to increase the past two weeks. Most recent buying has been for first quarter, and a number of automotive buyers are calling for early shipment, requirements and stocks having been underestimated. First quarter contracting is on the basis of fourth quarter prices.

Soft steel bars are being quoted at 2.10c, Chicago, for first quarter business, although tonnages are being placed in the Southwest under this figure.

Boston, Dec. 21.—Bar sales are irregular. Some producers report added firmness at 2.00c Pittsburgh. Others are shading this price. First quarter contracts are practically all entered. Sales hold close to the average for the year.

Pittsburgh, Dec. 21.—Merchant steel bar buyers are slightly more active. Cold finishers have furnished better specifications, having themselves received some fairly attractive releases of automotive tonnage. As usual at this time of year, orders are being held back, and this condition will prevail until after the turn of the year. Bar mills are averaging not more than 70 per cent in operations, and in some cases do not reach that high.

Refined iron bar sellers have been earnestly seeking business but find it difficult to find orders for large tonnages. Prices generally quoted are 2.90c and 3.00c, but buyers will not close upon anything beyond immediate wants.

Cleveland, Dec. 21.—One seller of soft steel bars has booked slightly more business in the past week than in any week in a month, but as a whole December is proving lighter than November in both shipments and new business. A real pickup in automotive demand is not in prospect until after the January shows. Rarely have so few first quarter contracts been closed at this time. Bars from a Cleveland mill are available at 2.00c, Cleveland, with this level shaded for attractive business. Out-of-town makers generally ask 2.00c, Pittsburgh, or 2.19c, Cleveland.

Philadelphia, Dec. 21.—Steel bar demand is materially smaller. All mills need business. Prices are firm at 2.00c, Pittsburgh. Mills say specifications from jobbers are unusually light.

Hoops and Bands

Narrow Hot Flats More in Demand than Wider Sizes

HOOP PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Business from users of hoop and band sizes of hot rolled flats is better than in wider material. The reason is that orders are drawn from diversified lines of industry. Numerous automotive releases are scheduled for late this month or early in January, but at present incoming business is insufficient to keep all equipment engaged. Quotations are based on 2.50c.

Many Views Offered in Pig Iron Rate Case

Chicago, Dec. 21.—Pig iron producers and consumers presented a wide divergence of views at the recent hearing here, before Examiner Walsh of the interstate commerce commission, of the Ohio-Indiana pig iron rate case. Revised rates in Ohio, Kentucky, Indiana and Michigan are under suspensions until March 1. Indiana interests attacked the proposed rate structure, claiming rates from Ohio to Indiana and from Illinois to Indiana were higher than for similar distances in other portions of central freight association territory. Some pig iron producers urged that the new rates be made effective at once and discrepancies be adjusted later.

Structural Shapes

Market Reacts from Unusually Heavy Awards of Previous Week—Inquiries Indicate Good Future Buying

REACTION from the high point of activity reached by the structural shape market in the preceding week carried current awards down below the seasonal normal. Large inquiries continue in process of negotiation, but heavy awards are not expected until after Jan. 1. A New York loft building will take 11,000 tons and two bridgework projects there 7900 tons. A 40,000-ton New York Central building and the 110-story Larkin building feature current inquiries for 1927 construction.

Mill prices for plain material show little change but fabricated quotations vary widely. Small lots are subjected to close bidding, many shops being without sufficient business to maintain unbroken operations.

STRUCTURAL SHAPE PRICES, PAGE 1638

New York, Dec. 21.—Following heavy buying of last week, structural business is only moderately active. Substantial inquiry is pending, with several good-sized projects scheduled to close before Jan. 1. Early action is expected on 11,000 tons for a loft at 2 Park avenue. Bridgework features new inquiry and includes one lot of 4700 tons and another of 3200. Shape prices are holding around 1.90c to 2.00c Pittsburgh, with occasional shading.

Boston, Dec. 21.—Despite the holiday season, buying of structural shapes holds well up toward the year's average. Most contracts of the week have been below 100 tons. Large producers are firm at 2.00c, Pittsburgh, or 2.365c, delivered.

Pittsburgh, Dec. 21.—Structural awards in this vicinity for several weeks past have been confined to the jobs taking 15 to 25 tons apiece. The trade learns here that plans for the 42-story building at Detroit are being revised. The newest inquiry to come up locally is the California avenue bridge across Woods Run, taking about 2000 tons. Prices on plain material are unchanged at 2.00c.

Cleveland, Dec. 21.—Inquiries in the structural market here during the past week were scarce, representatives of several larger fabricators not having received a single invitation to bid. Awards are featured by closing of 2100 tons for the Federal Reserve bank in Detroit to American Bridge Co. Plain material prices hold at 2.19c, Cleveland, or 2.00c, Pittsburgh. Fabricated prices are untested.

Chicago, Dec. 21.—A few important railroad bridge awards are pending, and estimates for pending work on new buildings in Chicago are under way. No awards of any size have been made the past week. American Bridge Co. is reported low bidder on the 4000 tons for the new central police station and municipal building in Chicago, and also on the new power house for the Standard Oil Co. at Whiting, Ind., calling for 2200 tons. Competition is keen among fabricators, as several of the smaller shops are eager to close on pending work to keep their operations intact.

Cincinnati, Dec. 21.—Awards of structural material the past week were of small consequence. Stacey Mfg. Co. booked a number of gas holder contracts which combined will require between 800 and 900 tons of steel. Plain material ranges from 1.90c to 2.00c, base, Pittsburgh.

Philadelphia, Dec. 21.—Structural shape demand continues to shrink further and shipments by eastern mills certainly are not above 50 per cent of capacity. As a result, special offers on prices have been made in some instances to induce attractive tonnages. The general range of prices is from 1.85c to 2.00c, Pittsburgh.

Awards Compared

	Tons
Awards this week	18,737
Awards last week	78,401
Awards two weeks ago	30,520
Awards this week in 1925	13,716
Average weekly awards, Nov.	27,631
Average weekly awards, 1926	28,883
Total awards to date, 1925	1,673,264
Total awards to date, 1926	1,462,908

CONTRACTS PLACED

5500 tons, office building, for Canal Bank & Trust Co., New Orleans, to McClintic-Marshall Construction Co.

3300 tons, 35-story Eaton tower building, Detroit, to Whitehead & Kales Co.

2100 tons, Federal Reserve bank branch, Detroit, to American Bridge Co., through Walbridge-Aldringer Co., general contractor.

2000 tons, theater building, Saenger Amusement Co., New Orleans, to the Virginia Bridge & Iron Co.

1500 tons, 600 refrigerator cars for Pacific Fruit Express Co. to Pacific Car & Foundry Co.

700 tons, Pennsylvania railroad signal bridges, Wilmington division, to McClintic-Marshall Co. In addition to 700 tons placed last week.

650 tons, highway bridges in Minnesota, to American Bridge Co.

600 tons, demonstration hall, Lansing, Mich., to Flint Structural Steel Co.

500 tons, work for Louisville & Nashville railroad, to Tennessee Coal, Iron & Railroad Co.

400 tons, state highway bridge, Little Falls, N. J., to American Bridge Co.

350 tons, Broad street substations, Philadelphia, to McClintic-Marshall Co.

295 tons, machine shop for Hawaiian Pineapple Co., near Honolulu, T. H., to Western Iron Works.

250 tons, Eagle theater, Pontiac, Mich., to Flint Structural Steel Co.

200 tons, power house for Leonard Refrigerator Co., Grand Rapids, Mich., to Lakeside Bridge & Steel Co.

170 tons, Pacific Bone Coal & Fertilizer Co. plant, Bay Shore cut-off, San Francisco, to Minneapolis Steel & Machinery Co.

150 tons, Downey road crossing for Los Angeles & Salt Lake railroad, Los Angeles, to United States Steel Products Co.

150 tons, Philadelphia Rapid Transit car house alterations, Philadelphia, to Phoenix Bridge Works.

117 tons, 20-stall roundhouse at Ogden, Utah, for Union Pacific railway, to Paxton & Vierling Iron Works.

100 tons, additional sheet piling, for municipal piers, Buffalo, to Bethlehem Steel Co.

CONTRACTS PENDING

11,000 tons, Schroeder & Koeppel loft, 2 Park avenue, New York; action expected shortly. This project was noted previously as involving 5000 tons.

5000 tons, M. O'Neil & Son department store, Akron, O.; bids extended to Dec. 28.

4700 tons, state highway bridge, Jersey City, N. J.; bids asked.

4000 to 5000 tons, additional work on Bamberger store, Newark, N. J.; pending.

3200 tons, miscellaneous bridgework, for Baltimore & Ohio railroad; bids asked.

3000 tons, Snake river bridge, Twin Falls, Idaho; bids being received.

2000 tons, California avenue bridge, Pittsburgh; bids taken by Pittsburgh, Dec. 21.

1800 tons, bridge Atlantic City, N. J.; pending.

1400 tons, Scottish Rite temple, Scranton, Pa.; pending.

1400 tons, No. 5 estimate, state hospital, New York; Guidone & Bottino, 52 Vanderbilt avenue, low bidders on general contract.

1000 tons, 500 tons each for gasoline cracking plants in Cleveland and Toledo, O., for Standard Oil Co. of Ohio; pending.

1000 tons, 15-story apartment hotel, 230 Central Park West, New York; bids asked.

1000 tons, highway bridges for New York state; bids asked.

735 tons, three buildings for Howard's Bend unit of city waterworks, St. Louis; Dunham Construction Co. low bidder on general contract at $778,141.

500 tons, garage, Camden, N. J.; pending.

400 tons, Medical building, San Jose, Calif.; bids opened.

300 tons, high school, Norristown, Pa.; pending.

300 tons, St. Callistus Roman Catholic church, Philadelphia; pending.

225 tons, Pelican theater, Klamath Falls, Oreg.,; new bids being called for.

200 tons, 9-story apartment, for H. H. Odgie, Sixty-sixth street, New York; bids asked.

200 tons, steel sheet piling, 7-story annex, Union Central Life Insurance Co., Cincinnati; general contract to S. W. Lindheimer Co.

200 tons, Suffolk Title & Guarantee Co. building, Riverhead, Long Island, N. Y.; pending.

Several thousand tons, Hayburn building, Louisville, Ky.; general contractors' bids in Dec. 30.

Tonnage unstated, 46-story Penobscot building, Detroit; bids being taken. Donaldson & Meier, Detroit, architects.
Tonnage indefinite, building for N. W. Ayers & Sons Philadelphia; pending.

Sheet Ware Less Active

Washington, Dec. 21.—Galvanized sheet metal ware shipments in October, reported by 12 manufacturers to the department of commerce, totaled 140,778 for pails and tubs and 41,295 for other types. Data for September and October do not include production and stocks on hand, these tabulations having been discontinued by the department of commerce.

PAILS AND TUBS
In Dozens

1926	Production	Stocks on hand end month	Orders shipped
January	148,537	115,087	150,430
February	138,159	125,002	124,955
March	120,396	125,837	116,036
April	91,707	109,858	109,228
May	95,929	108,672	103,455
June	87,205	104,435	96,437
July	108,631	92,340	119,663
August	127,366	86,963	134,323

OTHER
In Dozens

1926			
January	38,526	61,335	43,441
February	51,658	62,507	48,620
March	60,177	66,989	56,119
April	44,434	60,731	48,182
May	57,568	61,047	49,926
June	54,937	64,308	48,940
July	38,779	57,820	41,652
August	44,900	56,208	44,911

Shipments in Dozens*

	Pails and tubs	Other
September	140,491	43,060
October	140,778	41,295

*Other data no longer compiled.

Awarded Edison Medal

According to an annoucement just made by the American Institute of Electrical Engineers, the Edison Medal for 1926 has been awarded to Dr. William D. Coolidge, assistant director of the research laboratory, General Electric Co., Schenectady, N. Y., "for the organization of ductile tungsten and the fundamental improvement of the X-ray tube." The Edison Medal was founded by associates and friends of Thomas A. Edison and is awarded annually for "meritorious achievement in electrical science, electrical engineering or the electrical arts," by a committee of 24 members of the American Institute of Electrical Engineers.

Fluorspar Sales Small

New York, Dec. 21.—Sales of imported fluorspar continue to be made but involve small tonnages and the total is small. The market on the 85 and 5 per cent grade continues $16.75 to $17.25, duty paid, tidewater, per net ton.

Artificial gas for domestic use in Europe was first carried to consumers through service lines made from old gun barrels of which there was a surplus following numerous wars. The barrels were threaded on the end to provide tight joints.

Concrete Bars

Decreased Business and Competition Bring Lower Prices —Seasonal Dullness Prevails

SEASONAL dullness in the concrete reinforcing bar market is in full swing, unbroken except for an occasional large inquiry or award. Keen competition among sellers for the little business being placed is having a weakening effect on prices. Chicago, Buffalo and Cleveland especially reflect easiness. First quarter contracting has not been active.

REINFORCING BAR PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Local work involving reinforcing concrete bars, pending for several weeks, promises to continue in abeyance until after Jan. 1. This includes the Montefiore hospital, the Stanley theater and Clark office building. The newest proposition to come before sellers in this locality is the Pennsylvania highway commission bridge in Warren county, taking about 200 tons, on which a Youngstown contractor is low bidder. The mill quotation remains unchanged at 2.00c.

Boston, Dec. 21.—Greater firmness is developing in concrete bar prices at Boston, and much tonnage is in sight for January. On small lots the warehouse price is now 3.00c. The Concrete Steel Co. took 700 tons for the Cottage Farm bridge.

Buffalo, Dec. 21.—With the placing of a 100-ton contract for a new elevator project and a 65-ton school contract, pending inquiry for reinforcing bars is about cleaned up except for 250 tons pending for another school. Price competition is keen on reinforcing bars. Mill operations have been reduced in accordance with lowered demand.

Cleveland, Dec. 21.—Inquiries are the only live spots in the local concrete bar market. Of close to 2000 tons pending in this territory, less than one-third is in Cleveland. Openly quoted mill prices continue steady at 2.19c Cleveland, with reports of transactions down to 1.90c, Cleveland, unsubstantiated by definite sales. Rail steel remains steady at 1.80c, mill. Jobbers are quoting a maximum of 3.00c, Cleveland, for shipment from stocks. Few are able to obtain that level, down to 2.50c, Youngstown, being quoted.

Chicago, Dec. 21.—Brisk competition for reinforcing bar work is bringing out lower quotations for billet and rail steel bars. Some recent bids on building projects were based upon 1.90c for rail steel and one warehouse is reported to have gone below this figure. Billet bars are figured at 2.25c to 2.60c, with lower having been quoted. Reinforcing bar warehouses are expecting a better winter business than last year.

Cincinnati, Dec. 21.—With the building season virtually closed awards of reinforcing bars in this territory have dwindled. Several projects are pending involving large tonnages, including 250 tons for the annex of the Union Central Life Insurance Co. Prices on new billet and rail steel bars are unchanged.

Awards Compared

	Tons
Awards this week	2,313
Awards last week	3,415
Awards two weeks ago	2,595
Awards this week in 1925	6,785
Average weekly awards, Nov.	6,208
Average weekly awards, 1926	6,323
Total awards to date, 1925	306,040
Total awards to date, 1926	318,493

CONTRACTS PLACED

1020 tons, state highway bridge and viaduct, Newark, N. J., 680 tons to Igoe Bros. and 340 tons to Jos. T. Ryerson & Son. General contractor A. J. O'Neil Construction Co., Philadelphia. Formerly noted as all going to Igoe Bros.
700 tons, Cottage Farm bridge, Boston, to Concrete Steel Co.
300 tons, Pacific Portland Cement Co. plant, Redwood City, Calif., to unstated San Francisco jobber.
250 tons, New York Telephone Co. building, Paterson, N. J., to Igoe Bros.
200 tons, Susquehanna hydroelectric station, Conowingo, Md., to Donner Steel Co., through Stone & Webster, Inc.
150 tons, apartment building, Fifty-seventh and Federal streets, Chicago, to Barton Spider-Web System Inc., George L. Arquette, East Eightieth street and Wabash avenue, Chicago, contractor.
130 tons, wharf at Kalului, T. H.; general contract to E. J. Loyd, Honolulu, T. H. Steel to unnamed interest.
108 tons, Roscoe apartments, Chicago, to Olney J. Dean & Co.
105 tons, substructure, Masonic building, Providence, R. I., to Truscon Steel Co.
100 tons, Finance building, Oakland, Calif., to W. S. Wetenhall Co.
100 tons, International Milling Co. mill, Buffalo, to unstated Buffalo fabricator.
100 tons, apartment at 2051 West Washington boulevard, Chicago, to Inland Steel Co.
100 tons, Laurel Soap Co. building, Philadelphia, to A. Taylor Co.
100 tons, roadwork, Willow Springs, Ill., to Olney J. Dean & Co.

CONTRACTS PENDING

1000 tons, store and apartment house, Seattle; bids being received.
700 tons, Kroger warehouse, Cleveland; bids being compiled.
400 tons, department store at Akron, O., for M. O'Neil & Son; bids postponed until next week.
200 tons, Pennsylvania highway commission bridge in Warren county.
175 tons, addition to Don Pedro power plant, Turlock irrigation district, Turlock, Calif.; bids in Dec. 30.

140 tons, Kenmore Shore apartments, 5417-19 Kenmore avenue, Chicago; plans prepared.
140 tons, building for Firestone Tire & Rubber Co., Akron, O.; bids in.
120 tons, New Haven Trust Co. building, New Haven, Conn., bids in.
100 tons, Pierce Arrow garage, Boston; bids in. General contract to Walter Evatt.

Wholesale Iron, Steel Index Rises

Washington, Dec. 21.—The November wholesale index number for iron and steel was 135.5, compared with 135 for October and 136.2 for November, 1925, taking 1913 at 100 per cent, says the department of commerce.

The November index for nonferrous metals was 106.6, compared with 108.6 for October and 116 for November, 1925. Also, the November wholesale index number for structural steel was 132.4, the same as for October and compared with 129.1 for November, 1925.

Three Join Entente

Washington, Dec. 21.—Czechoslovakia, Austria, and Hungary joined the European steel entente Dec. 11, dividing a combined annual production quota of 2,000,000 metric tons of steel on an approximate basis of 70, 20 and 10 per cent, respectively, which are about equal to the steel output of these countries over the first quarter of 1926, states a cable to the department of commerce from Elbert Baldwin, Prague.

During this basic period Austrian steel mills produced 137,601 tons of steel products and the Czechoslovak production over the same period is estimated to have been about 400,000 tons. This group simultaneously completed a compact covering participation in the Balkan-Italian markets with the German producers.

Pig Iron Imports Good

Philadelphia, Dec. 21.—Imports of pig iron at this port predominated in the week ending Dec. 18. They included 8150 tons pig iron from Germany and 400 tons from Sweden. Swedish iron ore came in to the extent of 7047 tons. Sweden sent 114 tons of steel bars and Germany 3 tons. Structural steel imports were 128 tons from Belgium and 36 tons from Germany.

Ordnance Plant Is Fit

Washington, Dec. 21.—The naval ordnance plant at South Charleston, W. Va., has been inoperative during the past year but it is being kept in a proper state of preservation and in readiness for starting up on thirty days notice, states the annual report at the bureau of ordnance of the navy department.

North Western Expanded Metal Co., Chicago, has increased its capital stock from $750,000 to $1,000,000.

Rails, Cars

Track Fastenings Still Active at Chicago—Car Inquiries Good But Orders Are Light

PLACEMENT of 30,000 to 35,000 tons of track fastenings in the Chicago district by four roads features the railroad equipment market. About 5000 to 6000 tons of rails were placed. Car orders include 1200 for Lehigh Valley and 1000 for St Paul. Inquiry totals 27,000. Locomotive activity is lighter than in preceding weeks.

RAILROAD TRACK MATERIAL PRICES, PAGE 1638

New York, Dec. 21.—Heavy lists are pending but car buying is restricted to relatively small lots. Much the same situation applies in locomotives. The trade still expects substantial business to drop before Jan. 1.

Numerous railway interests in Japan and the Far East now are in the market for their rail requirements. Practically all of the individual requirements are small. The Shinkeihan Electric railway has placed 16 miles of 100-pound rails and splice bars with Mitsui & Co. who placed the business with an American mill. The Kongosan Railway of Korea is in the market for six miles of 60-pound rails and splice bars. The municipality of Osaka has placed an order for 3.2 miles of 100-pound rails and splice bars with Suzuki & Co. who in turn awarded the business to German makers. Tokio is in the market for 1.4 miles of guard rails. Nagoya is inquiring for 1 mile of groove rail and 1 mile of guard rail.

Philadelphia, Dec. 21.—Inquiries for 5000 to 10,000 tons of light rails are pending in this district. The principal inquiries are from the Lehigh Valley Coal Co. and Hudson Coal Co. Mills generally are quoting $36, Pittsburgh, per gross ton while makers of rail steel rails are quoting $34, mill.

Pittsburgh, Dec. 21.—Light rail orders for December will not come up to November's total since a let-down in coal mine buying developed. No cut prices have appeared, makers holding firmly to $36. Rerolled rails are available at $2 per ton less.

Cleveland, Dec. 21.—Wheeling & Lake Erie railroad has placed 5000 tons of rails with Carnegie Steel Co. Akron, Canton & Youngstown is expected to close shortly on 2400 tons.

Chicago, Dec. 21.—Distribution of the track fastenings ordered by the Pennsylvania a week ago has not been disclosed but it is understood that more than 65 per cent of the 12,000 tons placed went to Chicago district mills. Track accessories booked by Chicago mills the past week totaled 30,000 to 35,000 tons and were for four roads. From 15,000 to 20,000 tons for fastenings remain on inquiry. From 5000 to 6000 tons of rails also were placed with Chicago mills the past week by two smaller western roads.

Total cars awarded by both eastern and western roads the past week were more than 3000 of which 700 were for an undisclosed purchaser. It is reported also that a petroleum shipper has placed 400 tank cars in the East. Among the orders placed are 250 ore cars for Chicago & North Western to the Pullman Car & Mfg. Corp.; 300 tank cars for the North American Tank Car Co. to Bethlehem Steel Co.; and 400 underframes for the Fruit Growers Express to Ryan Car Co. In addition to these awards, 27,000 cars still are on inquiry.

CAR ORDERS PLACED

Buffalo, Rochester & Pittsburgh, repairs to 500 gondolas and 350 wooden box cars, to own shops.
Chicago & North Western, 250 ore cars, to Pullman Car & Mfg. Corp.
Chicago, Burlington & Quincy, one gas-electric rail motor coach, to J. G. Brill Co.
Chicago, Milwaukee & St. Paul, 500 stock cars to Bettendorf Co., 500 automobile cars to Pullman Car & Mfg. Corp.; 500 additional automobile cars inquired for will not be bought at present.
Fruit Growers Express, 400 underframes, to the Ryan Car Co.
Lehigh Valley, 1200 cars, 500 hopper and 200 automobile cars, to American Car & Foundry Co., 500 box to Standard Steel Car Co.
Lehigh Valley, 50 dump cars, to the Clark Car Co.
Long Island railroad, 60 motor and 30 trailer cars, to Westinghouse Electric & Mfg. Co.
North American Tank Car Co., 300 tank cars, to Bethlehem Steel Co.
Pennsylvania railroad, 60 multiple unit cars, awarded as follows: 30 to Standard Steel Car Co.; 15 to Pressed Steel Car Co; and 15 to American Car & Foundry Co.

LOCOMOTIVE ORDERS PLACED

Chicago, Rock Island & Pacific, 35 locomotives to American Locomotive Co.
Sydney & Louisburg railway, two switch engines, to American Locomotive Co.

CAR ORDERS PENDING

Atchison, Topeka & Santa Fe, 1000 refrigerator cars; bids asked.
Brooklyn Manhattan Transit Co., 150 steel subway cars or 50 triplex units; to inquire shortly.
Chesapeake & Ohio, 200 gondola car bodies; bids asked.
Chicago & North Western, 100 steel and aluminum suburban coaches, 20 combination passenger and baggage cars; pending.
Chicago, Rock Island & Pacific, 2000 freight cars; action expected at once.
Mobile & Ohio, 600 cars, 250 flat cars, 150 hoppers, 200 gondolas; inquiry out.
Pennsylvania railroad, 3000 to 4000 freight cars; contemplated.
Western Union Telegraph Co., 20 steel underframes and trucks for box cars; bids asked.

LOCOMOTIVE ORDERS PENDING

New Orleans & Great Northern, six locomotives; bids asked.

Wire

Market Is Sluggish as Users Hold Back Orders But Prices Stand at the Prevailing Level

PRODUCERS of wire and wire products are operating at about half capacity, matching production to demand. The latter is being held back for the sake of inventory and nothing is being bought except to fill pressing needs. No weakness has developed and prices are steady at the level that has prevailed for some time.

WIRE PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Wire and wire products, including nails, are sluggish, as usual at this time of year. The only orders are from jobbers or users with such low stocks that they have to buy some sizes or gages. Specifications are limited to actual requirements and everybody is paring these down as much as possible for the sake of showing low inventories. Operations are the same as for some time, about 50 per cent. Base prices are as firm as for many weeks, 2.50c on plain wire and 2.65c on wire nails.

Boston, Dec. 21.—The wire market is quiet at Boston. Operations are estimated at 60 per cent of capacity, but order books are light. The price on plain wire ranges from 2.75c to 2.865c, Boston. Nails hold at 2.65c, Pittsburgh.

Chicago, Dec. 21.—Specifications for wire products from the jobbing trade are growing lighter as inventory is approaching, but specifications from manufacturers indicate no substantial let-down. Business is not of sufficient strength to justify higher operations. Mill operations now are around 60 per cent.

Bolts, Nuts, Rivets

Tendency Is to Shade Prices to Obtain Current Tonnage

NUT AND BOLT PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Some nut and bolt manufacturers are endeavoring to maintain firm price schedules, but others are resorting to various expedients to promote buying. Operations are not averaging much above 50 per cent; as a consequence there is desire for a share of the going business. Orders promise to be scarce until after the first of the year. Rivet makers are naming 2.60c as the market price, but recent sales of both structural and boiler rivets have been made at 2.40c to 2.50c. Structural and railroad shops have been recent buyers of fairly large quantities.

New York, Dec. 21.—Demand for bolts and nuts is fair despite the usual seasonal let-down. It is estimated that eastern plants generally are operating on an average of 50 per cent. First quarter contracts pretty generally have been signed and the market appears firm at 50, 10 and 10 plus and extra 5 per cent to jobbers. About 100 tons of bolts and nuts are involved in the contract for dock work at Albany, N. Y., for which Foley Bros., Minneapolis, have the general contract.

Cleveland, Dec. 21.—With first quarter contracts being returned at a better rate than in previous years, bolt, nut and rivet manufacturers here are optimistic over prospects. Prices remain unchanged. December business has been seasonally slow, although a slight increase in activities shortly before the middle of the month is expected to put the total figure above the average for this season.

Chicago, Dec. 21.—First quarter contracting for bolts and nuts is well along but specifications for this month are light. Operations are about 60 per cent. First quarter contracting is on the basis of fourth quarter quotations.

Strip Steel

New Differentials Announced to Make Situation Clearer

STRIP PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Strip mill operations are about 50 per cent. Shipment are heavy, with a consequent drain upon backlogs. Incoming business for the month to date is less than half of what it was at this time in December, 1925. While several automobile companies are releasing small tonnages, the large Michigan makers' orders are negligible.

The effort to clarify the price situation on cold strips is spreading. Led by the American Steel & Wire Co. last week, other makers here as well as in the east and middle-west, are this week naming a 3.40c base, with the following differentials:

In 1 to 3-ton lots $3.40 base.
More than 3 tons—less than 10 tons $3.40 base less 10c.
More than 10 tons—less than 18 tons $3.40 base less 15c.
More than 18 tons—less than 50 tons $3.40 base less 25c.

These prices apply when the specifications are all of one size and for the same temper, and shipment to be made at one time. The hot strip price is firm at 2.30c, but only piecemeal business is being transacted.

New York, Dec. 21.—Cold rolled strip steel prices continue to decline. The market now is considered as 3.00c, base, Pittsburgh, equivalent to 3.34c, delivered New York, but this figure has been shaded. On the other hand the market on hot strip steel continues firm at 2.30c and 2.50c base, Pittsburgh, depending on width. Practically all consumers are covered on hot strip requirements over first quarter.

Cleveland, Dec. 21.—Hot rolled strip steel demand continues slow, with little activity on the part of consumers to cover first quarter requirements. Despite the unimproved demand, no weakness exists in prices. On narrow sizes 2.50c, Pittsburgh, is steady and on wide 2.30c. A local mill has been soliciting business on the basis of 2.50c, Cleveland, but has not taken enough business to disturb the general market level. Cold finished strip continues weak, with 3.25c, Pittsburgh, the common market. No large sales are being transacted but down to 3.00c, Pittbsurgh, is reported on attractive business.

Cold Finished Steel

Some Releases and Buying from Automotive Users Strengthen Situation

COLD FINISHED PRICES, PAGE 1638

Pittsburgh, Dec. 21.—Small orders rule in cold finished bars and while exceptions to 2.40c are noted, that represents the generally quoted market. Some releases from automotive and allied industries are being received for shipment after Jan. 1. Releases and some new buying have been done by Dodge Bros., and Chevrolet, Buick and other units of General Motors Corp., as well as a few other manufacturers. Other consuming lines which have been holding up their end for two months past continue activity so that good business is assured for first quarter from practically all users. Operations do not average more than 50 per cent.

Will Add Seamless Mill

Directors of the Jones & Laughlin Steel Corp., Pittsburgh have authorized the construction of a seamless tube mill at the Aliquippa works, Woodlawn, Pa. Engineering work on the new unit now is under way. Last April 122 by-product coke ovens of the Koppers-Becker type were completed at this division of the company which with the 488 rectangular ovens gives a complement of 610 ovens with a combined annual coking capacity of 1,270,000 net tons. During August of this year two additional buttweld pipe mills were added to the tube mill department at the Aliquippa works giving a total installation of four buttweld and three lapweld furnaces. A 9500-horsepower coal-fired boiler plant now is in the course of construction.

Chicago Tube & Iron Co. Inc. has increased its capital stock from $500,000 to $600,000.

Nonferrous Metals

Prices Hold Steady Although New Buying Has Been Light—Shipments Continue of Good Size—Sellers Are Cheerful

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Spot Straits Tin, N. Y.	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Dec. 15	13.62½	13.75	13.22½	69.25	7.80	7.72½	7.02½	26.80	12.75	35.00
Dec. 16	13.62½	13.75	13.22½	69.12½	7.80	7.62½	7.05	26.80	12.75	35.00
Dec. 17	13.62½	13.75	13.20	68.25	7.80	7.65	7.02½	26.80	12.62½	35.00
Dec. 20	13.62½	13.75	13.15	68.50	7.80	7.65	7.05	26.80	12.75	35.00
Dec. 21	13.60	13.72½	13.12½	68.05	7.80	7.65	7.05	26.80	12.75	35.00

NEW YORK, Dec. 21.—The nonferrous metals have been more steady during the past week than in some time but the quantity of new business placed was light. Some business was done in tin and the market recovered a little after a break.

It is expected that little buying will be done the balance of this year but shipments continue of good size and there is an air of confidence in the markets—not of anything great to develop but of steady buying to be done soon. Copper and tin have been bought somewhat ahead but it is thought some buying remains to be done early in the new year, while in lead, zinc and aluminum it is believed much January purchasing remains to be done.

Copper—The red metal has sold in a small way at 13.62½c, Connecticut, and 13.75c, Midwest, during the past week after big sales early in the month. Producers now appear well satisfied to wait, although in a few instances there are reports of slight shading. The export price of copper is steady at 13.95c c.i.f.

Tin—Some good business has been done with consumers in metal to arrive in each of the first three months of the new year. However, in the past few days the tin market has been more quiet and as supplies are not so stringent as they were recently and there is little demand for nearby metal, the premium on spot has almost disappeared while December arrival is about the same as January, around 68.25c. This price was 1 cent over March arrival.

Zinc—Galvanizers have not bought much prime western metal lately, and in some instances they have asked to have shipments held back, but with the big movement of last month the smelters are in a good position and the market has been steady. Moreover, easiness abroad has not bothered the market here sentimentally as it does sometimes. Some metal has sold at 7.00c, East St. Louis, but prices for the most part have been mostly slightly higher. High grade metal is unchanged at 9.25c delivered for prompt, and some contracts have been made for good quantities.

Lead—Prices were cut 10 points to 7.80c, New York, just a week ago although London was not weaker than it had been and the East St. Louis prices were actually a little firmer. However, there has been good competition to market the large world supplies.

Aluminum—Users still are holding off but sellers are marking time, so the market is dull and unchanged.

Committees for Waste Elimination Set Up

Washington, Dec. 21.—The national committee on metals utilization is working in close co-operation with the trade associations in the metals using industries, with the view of having the various associations set up their own committees to study the problem of waste elimination in their respective fields and furnish suggestions and recommendations which will facilitate the elimination of waste in the metals field.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	18.62½
Copper, hot rolled	22.25
Zinc, (100-pound base)	11.50
Lead full sheets (cut ¼c more)	11.75 to 12.25
Aluminum, bright flat, up to 10 gage	36.50
SEAMLESS TUBES	
High brass	23.50
Copper	24.25
RODS	
High brass (round ⅝ to 2½-inch)	16.37½
Naval brass	19.12½
WIRE	
Copper, small lots	15.62½
High brass	19.12½

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	8.50 to 9.00
Chicago	8.75 to 9.00
Cleveland	8.75 to 9.00
HEAVY YELLOW BRASS	
Chicago	7.25 to 7.75
Cleveland	7.25 to 7.50
ZINC	
New York	4.25
Cleveland	4.25 to 4.50
HEAVY COPPER AND WIRE	
New York	10.87½ to 11.12½
Boston	10.00 to 10.75
Chicago	10.00 to 10.75
Cleveland	10.50 to 10.75
RED BRASS BORINGS	
New York	7.75 to 8.00
YELLOW BRASS TUBING	
Cleveland	6.50 to 6.75
LIGHT COPPER	
New York	8.75 to 9.00
Chicago	9.00 to 9.25
Cleveland	9.50 to 9.75
LIGHT BRASS	
Boston	6.00 to 6.25
Chicago	6.00 to 6.50
Cleveland	5.50 to 5.75
ALUMINUM	
Clippings, Cleveland	19.00 to 20.00
Borings, Cleveland	11.50 to 12.00
Cast, Cleveland	15.50 to 16.50
Cast, Boston	15.75 to 16.75

Secondary Metals

Remelt aluminum No. 12	21.50 to 22.00
Brass ingot, 85-5-5-5	11.62½ to 11.75

Coke By-Products

Benzols Are Sometimes Shaded But Other Distillates Are Holding Firmly

New York, Dec. 21.—Pure and 90 per cent benzols still are being quoted generally at 24 cents, works, for material in tank car lots, and 29 cents in drums, although concessions of 1 cent are being noted. Other distillates, however, such as commercial xylol, toluol and solvent naphtha, are firm, due in no small measure to continued good demand by the paint and lacquer interests. Toluol and solvent naphtha are holding at 35 cents, works, in tanks and 40 cents in drums; and commercial xylol at 36 cents in tanks and 41 cents in drums.

While little buying has resulted, the drug trade is commencing to show interest in naphthalene for spring requirements. The first of the year should see much of this buying well under way. Prices meanwhile are holding at 5 to 6 cents on flakes and 6 to 7 cents, on balls. Phenol is featureless.

Sulphate of ammonia is dull with prices holding at $2.45 to $2.50, delivered, for material for domestic account and $2.55 to $2.60, port, for material in double bags for export. This latter is a slightly higher range than that which prevailed recently.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.23 to $0.24	
90 per cent benzol	0.24	
Toluol	0.35	
Solvent naphtha	0.35	(nominal)
Commercial xylol	0.36	(nominal)
Phenol	0.22	0.22

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.07
Naphthalene balls	0.06 to 0.08

Per 100 Pounds Delivered

Sulphate of ammonia	2.47½

Warehouse

Preholiday Lull Brings Customary Decrease in Sales Volume—Prices Show More Weakness Although Quotations Are Unchanged

DIMINISHING business in the iron and steel warehouse trade reflects the customary preholiday lull. Small fill-in orders to carry production up to inventory shutdowns comprise a good proportion of current sales. Although market quotations are unchanged, increased tendency to shading is noticed.

Outside of a little hesitancy and the tendency to defer purchases until after Jan. 2, sales in the Pittsburgh warehouse district are keeping up to a high level. Manufacturers are curtailing purchases generally. No weakness in prices is encountered.

Prices continue steady in the New York metropolitan jobbing district. Sheets, usually a weak item, are holding firm with galvanized and blue annealed grades moving in good volume. A feature of the market this month has been a good export demand from the West Indies and Central America.

Iron and steel sales by Buffalo have dropped to a low level, as is usual at the season. Only necessary material is being bought. Prices are unchanged.

With the inventory period at hand the warehouse market in the Cincinnati district is virtually at a standstill. Indications are that distributors will close the month with less business booked than in December 1925. Prices on plates and sheets have been shaded.

Arrival of the inventory period at St. Louis and the usual seasonal slowing down in industrial activities is being reflected in smaller sales by warehouses. The decrease, however, is not radical, and no greater than the average for the past several years. Bar sales in early December have been disappointing, and demand for sheets has fallen to small proportions.

The seasonal drop in the last half of December is upon the Chicago iron and steel warehouse market. Buying has slackened off considerably and the volume of inquiry also is low as expected. The first price decline in many months at Chicago has come in cold rolled strip steel; it is reduced by main jobbing interests from $6.25 to $5.85 per 100 pounds, base.

Philadelphia jobbers report a further substantial let down in December warehouse business. Sales so far

(*Concluded on Page* 1653)

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles	3.30c
New York	3.24c
Philadelphia	2.90c to 3.20c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.80c to 4.06c

IRON BARS

Boston	3.265
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.90c to 3.20c
St. Louis	3.15c
Tulsa	3.80c to 4.06c

REINFORCING BARS

Boston	3.265 to 3.50c
Buffalo	3.30c
Chicago, billet	2.25c to 2.60c
Chicago rail steel	2.00c
Cincinnati	3.20c to 3.30c
Cleveland	2.50c to 3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles, C.L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	3.15c
Philadelphia	3.00c to 3.15c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	2.30c
San Francisco, L C. L.	2.45c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.50c to 2.60c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.25c
Ft. Worth	4.50c
Los Angeles	3.20c
New York	3.34c
Philadelphia	2.65c to 3.20c
Pittsburgh	3.00c
Portland	3.10c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.80c to 4.16c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.00c
Cleveland, 3/16-inch	3.225c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Ft. Worth	4.50c
Los Angeles	3.20c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.75c to 3.20c
Philadelphia, 3/16-inch	2.95c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.80c to 4.16c

NO. 10 BLUE ANNEALED SHEETS

Boston 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.65c
Los Angeles	4.00c
New York	3.89c
Portland	4.25c
Philadelphia	3.50c
Pittsburgh	3.40c
San Francisco	4.00c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.05c to 4.25c

NO. 24 BLACK SHEETS

Boston	5.10c
Buffalo	4.30c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.80c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.35c
Philadelphia	4.35c
Pittsburgh	3.95c
Portland	4.90c
San Francisco	4.90c
Seattle	4.90c
St. Louis	4.45c
St. Paul	4.20c
Tulsa, No. 28	5.00c

NO. 24 GALVANIZED SHEETS

Boston	5.80c
Buffalo	5.15c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.05c
Ft. Worth	5.90c
Los Angeles	5.75c
New York	5.10c
Philadelphia	5.30c
Pittsburgh	4.80c
Portland	5.75c
San Francisco	5.65c
Seattle	5.75c
St. Louis	5.25c
St. Paul	5.15c
Tulsa, No. 28	6.00 to 6.31c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.80c
Ft. Worth	4.40c
Los Angeles	4.05c
New York	3.99c
Philadelphia	3.75c to 3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.65c
Detroit	4.30c
New York	4.49c
Philadelphia	4.00c to 4.25c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	4.05c	4.55c
Buffalo	3.90c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100 inch, 500 lbs. lots	6.15c
Buffalo	6.25c
Chicago	5.85c
Cincinnati	7.15c
Cleveland, over 500 lbs. lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	6.25c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL

New York duty paid

Swedish, hollow drill steel	15.00c
Swedish iron bars round	6.25c
Flats and squares	6.50c

WELDED PIPE

Discounts from warehouse, New York City Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—28	+21
¼ to ⅜-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6-inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—12

WROUGHT IRON PIPE

	Black	Galvanized
⅛ to ⅜-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	— 1	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 6
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 3	+16

Tin Plate

Requirements of Coast Canmaker Placed—Other Tonnages To Come

San Francisco, Dec. 18.—(*By Air Mail*)—A fair volume of steel tonnage was booked this week by mill representatives, activity in the cast iron pipe and structural shape markets being more pronounced. Prospects for the early part of 1927 are encouraging as a large number of projects are contemplated, which will require heavy tonnages of plates, shapes and other forms of steel products. The price situation, on the whole, is well sustained and little shading is being indulged in.

The H. B. Prince Co., Oakland, Calif., has placed its tin plate requirements with the Weirton Steel Co. and the Washington Tin Plate Co., approximately 50,000 base boxes being involved. The Western Can Co. will not place its requirements at present as it has a heavy carry over. The G. & Eastern Can Co., San Jose, Calif., possibly the biggest independent can company on the coast, with an estimated capacity of 60,000,000 cans a year, has placed its requirements with Jones & Laughlin Steel Corp.

Sales of foundry iron were confined to small lots and no large inquiries are current this week. The Columbia Steel Corp. reports a fair sized tonnage booked for the first half of next year, made up, mostly of lots of less than 500 tons. Little improvement is reported in the rate of operation among jobbing foundries. Prices continue unchanged.

It is reported that the Los Angeles county flood control district will defer further purchases of rails for the San Gabriel canyon railroad until next year and the recent inquiry for 1900 tons of rail has been withdrawn. Bethlehem Steel Co. was low bidder on this lot.

While many buyers of cement coated nails have not yet come into the market for their next year's requirements, it is expected these inquiries will develop after the first of the year and will involve about 40,000 kegs. The California Packing Corp., San Francisco, is inquiring for 15,000 to 20,000 kegs and the Certaineed Products Corp., Richmond, Calif., is in the market for 6000 to 7000 kegs.

Welders in Conference

About 175 welders and plant officials attended the three-day state welding conference conducted Dec. 15-17 under the direction of Purdue university, Lafayette, Ind. A number of the country's welding authorities attended the meeting and presented technical papers. Among them were J. H. Deppeler, chief engineer, thermit department, Metal & Thermit Corp., Jersey City, N. J.; W. M. B. Brady, district arc welding specialist, General Electric Co., Chicago; A. G. Bissell, general engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; T. W. Greene, mechanical engineer, and E. E. Thum, manager technical publicity department, Linde Air Products Co., New York; R. E. Kinkead, welding engineer, Lincoln Electric Co., Cleveland; and several members of the university staff. Six welding equipment manufacturers displayed and demonstrated welding and cutting apparatus.

Sheet Sales and Output Lower in November

Reflecting the general letdown in sheet buying in November, the figures issued by the National Association of Sheet and Tin Plate Manufacturers show sales by companies reporting to it dropped to 185,235 tons. This is the lowest total of the year, with the exception of February. November production amounted to 278,455 tons, compared with 314,598 in October. Shipments in November, 262,797 tons, dropped from 301,474 tons in October. The only lower month of the year was June, with 262,231 tons. Comparative figures for November and October follow:

	Nov., 1926	Per cent of capacity	Oct., 1926	Per cent of capacity
Total sales for month	185,235	57.8	212,029	68.3
Total production	278,455	86.9	314,598	101.4
Total shipments	262,797	82.0	301,474	97.2
Unfilled tonnage, Dec. 1 and Nov. 1	500,120	156.0	581,993	187.6
Approximate finished stock awaiting shipment	124,175	38.7	100,448	82.2
Approximate in stock, unsold	40,929	12.8	40,758	13.1

The total number of hot mills in the United States is 712, having a capacity for November, 1926, of approximately 433,700 net tons, and the percentage of the capacity to which the figures shown above are related is 73.8. Following are further comparisons:

	Sales	Production	Shipments
November	185,235	278,455	262,797
October	212,029	314,598	301,474
September	448,147	307,459	302,198
August	283,055	293,703	281,602
July	352,414	239,764	264,025
June	284,319	268,448	262,231
May	201,743	264,541	267,299
April	249,866	294,811	288,759
March	304,233	319,132	320,623
February	181,101	299,553	290,026
January, 1926	253,323	328,643	333,485
December	319,504	326,960	293,579
November	370,361	336,021	294,660
October	403,499	348,714	332,211
September	286,029	295,810	262,050
August	239,492	270,212	243,204
July	252,871	246,404	223,454
June	286,453	266,290	231,006
May	186,538	260,470	232,372
April	193,949	280,082	263,174
March	263,666	290,308	279,437
February	235,980	283,290	255,080
January, 1925	241,000	317,424	283,645

Fabricated Structural Steel Sales Drop

Washington, Dec. 21.—Bookings of fabricated structural steel in November, computed at 192,150 tons, dropped slightly from 201,300 tons in October, but are far below November, 1925, with 216,550 tons, according to returns to the department of commerce. Actual bookings reported by 181 companies with 263,325 tons monthly capacity were 166,505 tons in November. Shipments were computed at 222,650 tons, or 73 per cent of capacity, while bookings were only 63 per cent of capacity. Further comparisons are based on reports by 203 identical companies. Data in earlier months include reports of 21 companies now out of business.

1925	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Nov.	191,170	71	216,550	225,700
Total (11 mo.)	....	....	2,479,650	2,513,200
Dec.	200,147	74	225,700	240,950
Total (12 mos.)			2,706,350	2,754,150
1926				
Jan.	161,414	59	179,950	207,400
Feb.	163,350	60	183,000	192,150
March	184,139	68	207,400	250,100
April	196,704	73	222,650	244,000
May	206,899	76	231,800	237,900
June	203,415	75	228,750	268,400
July	192,036	71	216,550	268,400
Aug.	222,444	82	250,100	250,100
Sept.	†162,640	60	183,000	253,150
Oct.	‡176,286	66	201,300	250,100
Nov.	*166,505	63	192,150	222,650
Total (11 mo.)	....	....	2,296,650	2,644,350

*Reported by 181 firms with a capacity of 263,325 tons.
†Reported by 195 firms with a capacity of 269,205 tons.
‡Reported by 193 firms with a capacity of 266,255 tons.

Stoker Sales Decrease

Washington, Dec. 21.—Sales of mechanical stokers, as reported by 12 manufacturers to the department of commerce, totaled 85 in November, the lightest since February. Most of the drop from October came in water tube installations which fell to 60 from 84. Further comparisons of sales follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1,464	177	1,287
1924 Total	1,128	161	967
1925 Total	1,348	263	1,085
October	114	22	92
November	76	8	68
December	108	21	87
January, 1926	72	10	62
February	83	12	71
March	132	31	101
April	145	22	123
May	129	54	75
June	175	24	151
July	125	20	105
August	104	25	79
September	127	31	96
October	112	28	84
November	85	25	60

Lovejoy Tool Works, Chicago, has changed its capital stock from $35,000 to 500 shares no par value.

Feiker Becomes Managing Director of A. B. P.

Frederick M. Feiker has been appointed managing director of the Associated Business Papers, Inc., an office newly created by the executive committee. This announcement marks the inauguration of a more active policy and a broader program for the Associated Business Papers in the promotion and development of higher standards of journalism for the business press. In pursuance of this plan new and larger quarters have been taken at 52 Vanderbilt avenue, New York.

Mr. Feiker brings to the A. B. P. a background of broad experience, embracing 15 years as editor and publisher, a year and a half in the United States department of commerce, three years in trade association leadership and a practical experience in educational work.

Mr. Feiker is a graduate as an electrical engineer from Worcester Polytechnic Institute, class of 1904. He then became technical journalist for the General Electric Co., writing for trade and industrial papers. Later he joined the A. W. Shaw Co. and established the magazine *Factory* subsequently becoming chairman of the editorial board of *System* and *Factory*. In 1915 he went with the McGraw Publishing Co. as editor of the *Electrical World* and guided the early development of *Electrical Merchandising*, eventually becoming vice president and editorial director of the McGraw-Hill company.

In 1921 Herbert Hoover invited Mr. Feiker to join him in Washington as assistant to the secretary of commerce, to personally aid him in carrying out plans for the reorganization of the department of commerce in its relations with trade and industry. He secured leave from the McGraw-Hill company and spent 18 months in government work. During that period he helped to establish the division of simplified practice, revamped the bureau of foreign and domestic commerce on the basis of service to commodities, assisted in the organization of the monthly survey of business statistics, and remade the department's publication, *Commerce Reports*.

When this work was completed in 1923, Mr. Feiker became operating vice president of the Society for Electrical Development, where he has done an outstanding work in organizing competitive commodity promotion campaigns for groups of manufacturers.

Jesse H. Neal, for eleven years executive secretary of the Associated Business Papers, has resigned, effective Jan. 1. He and Mrs. Neal will leave on a six-months' Mediterranean trip in January.

Automotive Production Lowest in 15 Months

Washington, Dec. 21.—November production of motor vehicles in the United States and Canada was the lowest in 15 months. Sales of passenger cars in the United States totaled 219,479, the lightest since August, 1925. Factory sales of trucks in the United States totaled 36,334 in November, compared with 42,890 in October. The figures for this year are based on reports to the department of commerce of 163 manufacturers in the United States in recent months, data for earlier months including 90 now out of business.

Passenger Cars

Totals for United States and Canada

	1923	1924	1925	1926
Jan.	228,860	293,822	213,851	284,703
Feb.	260,320	343,444	253,955	334,524
Mar.	427,038	357,006	334,214	399,105
April	351,622	346,355	393,262	401,836
May	358,646	286,266	384,548	394,569
June	343,985	225,034	366,510	358,365
July	303,497	244,503	360,124	329,950
Aug.	318,848	255,193	223,517	393,040
Sept.	302,340	263,468	274,227	363,537
Oct.	338,469	260,845	408,017	*300,142
Nov.	288,810	204,316	337,435	226,223
Dec.	279,862	182,028	286,141	.....
Totals'	3,702,391	3,262,764	3,835,801	3,785,994

Trucks

Totals for United States and Canada

	1923	1924	1925	1926
Jan.	20,506	30,627	28,202	33,461
Feb.	23,283	32,756	34,481	41,685
Mar.	36,619	36,270	45,179	49,233
April	39,641	37,766	47,983	53,887
May	45,677	35,112	45,718	51,333
June	42,453	28,884	38,150	47,115
July	31,703	26,227	41,870	41,921
Aug.	32,195	28,503	37,849	47,907
Sept.	29,626	31,820	60,482	51,299
Oct.	31,515	32,332	46,013	*46,965
Nov.	29,166	27,766	40,048	40,288
Dec.	28,862	27,324	34,487	.....
Total	391,246	375,426	500,461	505,094

*Revised.

Marion Shovel Optioned

An option for the purchase of the controlling interest of the Marion Steam Shovel Co., Marion, O., has been obtained by Blair & Co., New York investment bankers. The option will expire Feb. 10, 1927, according to the announcement of President Frank A. Huber, of the Marion company. The manufacturing property is estimated to be worth $5,000,000.

Pays 50 Cent Dividend

Directors of the Sharon Steel Hoop Co., Sharon Pa., have declared a 50 cent dividend on the company's common stock. This is the first dividend paid upon the stock since 1919. The dividend is payable to stockholders of record, Jan. 4.

Safety Records Attained By Illinois Steel Co.

Chicago, Dec. 21.—The Illinois Steel Co. has announced the completion of a remarkable record of safety at the South works, South Chicago. The entire works, between Oct. 26, 1926, and Dec. 14, inclusive, did not suffer a single lost-time accident. Since approximately 7555 men are employed at the plant, this period corresponds approximately to 3,100,000 working hours. The works' previous best record was 32 days, as against the present record of 50 days.

Announcement was made recently that the bessemer department of the Joliet works of the company had completed an entire year without a lost-time accident, and further that every department at Joliet at some time or other since January, 1925, has operated 365 consecutive days without an accident. The entire plant, employing from 2800 to 3000 men, recently completed 116 days without lost time due to accidents.

At the Gary works, where 13,300 men are employed, not an accident was reported from Sept. 20, 1926, to Oct. 9, a period of 19 days and covering approximately 1,900,000 working hours. At this plant the axle mill has operated over five years. from Jan. 28, 1920, to date, a total of 2512 days or 2,543,893 working hours, without a lost-time accident.

Preholiday Lull On

(*Concluded from Page* 1651)

in December are considerably below those of December 1925. Prices continue unchanged.

Sales by Cleveland warehouse interests, although falling behind November, are ahead of December 1925. Business in the past week reflected further decline from early December and an increase in trading is not anticipated until about Jan. 10. Prices hold firm with an insufficient quantity of attractive business to induce shading.

Iron Shipments High

(*Concluded from Page* 1639)

ing of three blast furnaces in this district will meet the deflection in demand for foundry iron. Quotations continue firm at $20, base, Birmingham. The melt is being reduced and some plants will suspend about 10 days, over the holidays.

Philadelphia, Dec. 21.—The leading development in the pig iron market is an inquiry from a Pennsylvania user for 2000 to 3000 tons of low phosphorus iron. Otherwise demand is quiet. Foundry iron now is quotable at $22 to $22.50, base, eastern Pennsylvania furnace.

Car Builders Are More Hopeful

Increased Requirements and Improved Financial Position of Railroads Basis for Expectations in 1927—Capacity Enlarged, While Fewer Cars Are in Operation Than Five Years Ago

NEW YORK, Dec. 21.—With more cars under active contemplation than perhaps at any other time in 12 months car builders are hopeful that the profound dullness of the past two years is nearing an end. They are reluctant to make predictions, bearing in mind the prophecies that have failed in recent years, the past year in particular.

Not in considerable time had the outlook appeared as promising as at the beginning of 1926. Talk of accumulated car requirements was generally heard. There had been one or two fairly good years since the war, but the average was well below the 150,000 to 180,000 regarded as normal. Railroads had operated with remarkable efficiency, yet the growth of freight traffic was increasing steadily from year to year. With the approach of 1926 the railroads were in a vastly improved financial position. What happened? One of the poorest years in the history of the industry.

The plight of car builders can well be portrayed in a few words. Domestic freight car orders for the first 11 months of 1926 aggregated 51,500 cars. Production during that period was 76,448 cars. The country's capacity is 400,000. Various shops have closed down during the year. One large unit of a leading builder has suspended for the first time in 25 years.

To add further to the builder's misfortune heavy car repairs have been exceedingly slack. So far this year repairs have been made to about 15,000 cars, as compared, for instance, with over 64,000 cars five years ago. Export business, never a heavy item, has fallen off about 1000 cars.

Twenty per cent of this year's freight car business was taken either by the railroads themselves or by steel companies. Of the total number of cars specified, the railroads will build 5100 and the steel companies 5300; this is in addition to a certain amount of passenger car construction, heavy repairs and similar work, such as mine car business.

The slackness of the present period has tended to aggravate the growing concern and resentment some builders feel over what they regard as encroachment of their field by these interests, especially the railroads whose production in these lines, they believe, is not justified by economic results. Cost figures are not available, yet the labor situation peculiar to the railroads, the lack of competitive conditions and various other factors are believed by the car builders to interfere with sound and effective production on the part of the carriers.

Passenger car business as in some other recent years has stood out as a bright spot in the situation. With more than 2000 placed the record for the year has been above normal. Were it not for this and action by some companies in expanding their activities to include certain other lines of affiliated work, car builders would have had difficulty in meeting operating expenses.

While continued dullness has closed various shops, a material revival would soon see most of them striving for business. Many believe that it will be a long time before requirements approach existing capacity.

Capacity has increased 40,000 to 50,000 cars since the war. Some companies have dropped by the wayside, but this loss has been more than offset by additions and more efficient facilities at others. The present capacity of 400,000 cars does not include railroad shop capacity, but it does include the steel works and at least one shipbuilding company, which have a combined annual capacity of around 36,000 cars.

Virtually the same factors for encouragement that prevailed last year prevail this year, only they are a little brighter. The railroads are in better financial position and requirements are a little heavier.

Fewer cars are in operation than five years ago. Authoritative estimates place the decline at 25,000 cars. On the basis of retirement and replacement statistics the decline is substantially greater. During the 5-year period, and estimating this year's figure at 100,000 retirements have amounted to 671,890, while production or replacements in that time, up to and including the first 11 months of this year, totaled 536,148, indicating a shrinkage of 135,742 cars. However, it is believed that many cars included in the retirement lists have been completely rebuilt and placed back into service, so that the smaller figure is perhaps more accurate.

When it is considered that the annual increase in freight traffic is about 5 per cent it appears that a revival in buying cannot be far off.

Inspect 5-Story Welded Building at Sharon

Several hundred architects, builders, contractors and steel men met at Sharon, Pa., Dec. 15 and 16, where they were the guests of the Westinghouse Electric & Mfg. Co. in the first public viewing of the company's 5-story arc-welded steel building now approaching completion. Floor dimensions of the building are 70 x 220 feet with a height of 80 feet. Steel required for the fabrication amounted to about 700 tons. The girders are of special design for arc welding and not an adaptation of former practice.

Elects New Officers

Pittsburgh, Dec. 21.—Dr. A. C. Fieldner, superintendent, Pittsburgh Experimental station, bureau of mines, was the speaker at the December meeting of the Pittsburgh section of the American Chemical society, Dec. 16. His subject was "Recent Development in Carbonization and Procession of Coal." A banquet preceded the meeting. Officers elected were: Chairman, Dr. Alexander Lowy, professor of organic chemistry, University of Pittsburgh; vice chairman, W. A. Hamor, assistant director, Mellon Institute of Industrial Research; secretary, G. G. Dunkle, assistant chemist, bureau of mines; and treasurer, C. E. Nesbitt, chief chemist, Edgar Thomson work, Carnegie Steel Co.

Schedules New Hot Mills

Baltimore, Dec. 21.—Four new sheet mills have been placed in operation at the Maryland plant of the Bethlehem Steel Co., at Sparrows Point, Baltimore. These new units add at least 35,000 tons to the company's annual capacity for producing black and galvanized sheets here.

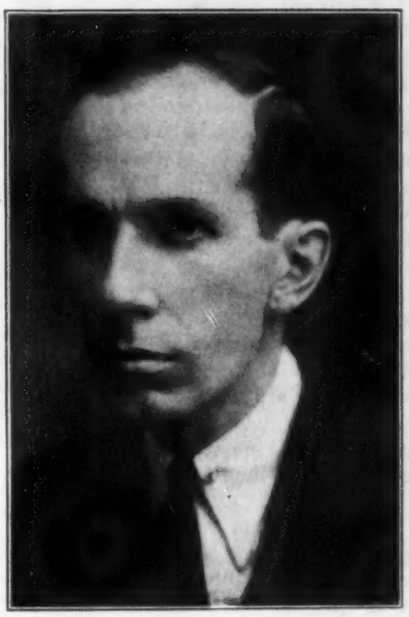
Industrial Men in the Day's News

Vincent Massey, Appointed Canadian Minister to Washington

AS THE third generation of Masseys manufacturing agricultural implements in Canada, he has an intimate knowledge of industrial and economic conditions of his country.

LEAVING active direction of his company he entered the field of governmental politics, becoming director of the corporation's committee and later a cabinet member.

HE HAS gained wide recognition in Canada for his activities in educational, artistic and philanthropic movements. He has varied interests.



VINCENT MASSEY, who recently was appointed Canadian minister to Washington, has been a prominent figure in the public industrial life of Canada, and is exceptionally well fitted to fill that important position. He is the grandson of Hart Massey, founder of the Massey Harris Co., Toronto, manufacturer of agricultural implements, and the son of Chester Massey, formerly president of that company. Mr. Massey is in his fortieth year, having been born on Feb. 20, 1887.

He received his education at the Model school, Toronto, St. Andrews college and the University of Toronto, graduating in arts from the last in 1910. He studied at Oxford Balliol college where he received the degrees of B. A. in 1913 and M. A. in 1918. He was a lecturer in history at the University of Toronto from 1913 to 1915, and dean of residence at Victoria college, Toronto. The erection and building of Hart house, named after his grandfather, an artistic center in connection with the university, was carried out under his direction. When war broke out he offered his services to the government, and from 1915 to 1918 was in charge of musketry training in military district No. 2 comprising Toronto and central Ontario. He held the rank of temporary lieutenant-colonel. Mr. Massey received the appointment of associate secretary of the war committee of the federal cabinet in 1918. He was with the government reparation committee as general secretary and later was appointed director. Massey Harris Co. claimed his attention from 1919 to 1921 when he was a director and secretary. In the latter year he was chosen president of the company, succeeding his father. He held this position until 1925 when he resigned to become a member without portfolio of the cabinet of MacKenzie King. The government sustained defeat in the election of that year and Mr. Massey was unsuccessful as Liberal candidate for the constituency of Durham.

Mr. Massey is a man of varied interests and a wide outlook on life. He has devoted much attention to educational, artistic, and philanthropic movements and held many important positions in organizations for the promotion of these objects. Mr. Massey is a trustee of the national gallery of Canada; a member of the council of the art gallery of Toronto; a governor of the Conservatory of Music; president of the National Council of Education; member of the Ontario Society of Architects; and a member of the board of governors of the University of Toronto.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

BANCROFT GHERARDI, vice president and chief engineer, American Telephone & Telegraph Co., New York, has been nominated as president of the American Institute of Electrical Engineers, to accede to office, Aug. 1, 1927. Mr. Gherardi was born in San Francisco, April 6, 1873, and was graduated from the Polytechnic Institute of Brooklyn, N. Y. in 1891 with a bachelor of science degree and from Cornell university, Ithaca, N. Y., in 1893 with a mechanical engineer's degree and in 1894 with a master's in that science. He joined the New York Telephone Co. in 1895 and has been in the telephone industry since. He has been prominent in engineering society activities.

J. L. Beaver, associate professor of electrical engineering, Lehigh university, Bethlehem, Pa.; C. O. Bickelhaupt, vice president, Southern Bell Telephone & Telegraph Co., Atlanta, Ga.; O. J. Ferguson, dean, college of engineering, University of Nebraska, Lincoln, Nebr.; E. R. Northmore, Los Angeles Gas & Electric Co., and A. B. Cooper, general manager, Feranti Electric Ltd., Toronto, Ont., were nominated for the vice presidencies.

* * *

John A. Topping, chairman of the Republic Iron & Steel Co., has been made a director of the Banker's Trust Co., New York.

* * *

Fred A. Geier, president, Cincinnati Milling Machine Co., Cincinnati, has been appointed a member of the board of directors of the Cincinnati branch of the Federal Reserve bank.

* * *

L. H. Link, Fort Wayne, Ind., secretary of the Bass Foundry & Macine Co., of that city, recently was elected president of the Indiana Manufacturers association.

* * *

James E. Van Auten, who joined the Nash Motors Co., Kenosha, Wis., as works manager of the Milwaukee plant on July 16, 1923, has been promoted to general manager of the Milwaukee division.

* * *

Walter Rautenstrauch has been elected president of the Splitdorf-Bethlehem Electrical Co. Mr. Rautenstrauch has resigned as president of the Fred F. French Co., New York, effective Jan. 1, to assume his new duties.

* * *

Carl C. Conway, formerly vice president of the Continental Can Co., has been elected president to succeed Thomas G. Cramwell. The latter has been elected to the newly created position of chairman of the board of directors.

* * *

Harry G. Stoddard, treasurer of the Wyman-Gordon Co., Worcester, Mass., manufacturer of automobile crankshafts and castings, has been named to the directorate of the Liberty Mutual Insurance Co., as has Frederick P. Royce, vice president of Stone & Webster, Inc., Boston.

* * *

John O. Rinek, former manager of the Atha works and Spaulding & Jennings works of the Crucible Steel Co. of America, New York, has been appointed assistant general manager of the Universal Steel Co., Bridgeville, Pa., manufacturer of tool and alloy steels.

* * *

G. C. Beishline has been appointed general superintendent of the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., succeeding the late Charles Elliott. Mr. Beishline has been with the Mt. Vernon company for 13 years, going to that organization from the American Car & Foundry Co. at Berwick, Pa.

* * *

Hutcheson Page has been elected a director of Rogers Brown & Crocker Bros. Inc., New York, filling the vacancy on the board caused by the death recently of D. Fairfax Bush. Mr. Page formerly was with the Vernon Metal & Produce Co., New York, and assumed charge of the rubber department of Rogers Brown & Crocker Bros. Inc. last April.

* * *

Benjamin J. Van Horn, manager of crane sales for the Harnischfeger Sales Corp., Milwaukee, was guest of honor at a dinner given by the P. & H. Old Timers' club on Dec. 10 in celebration of the completion of thirty years' connection with the company. He started as a stenographer with the Pawling & Harnischfeger Co. now the Harnischefeger Corp.

* * *

W. H. Thompson, assistant chief engineer of the H. K. Ferguson Co., Cleveland, engineer and builder, has returned from Japan, having been in that country three years in supervision of construction projects for his company.

* * *

Walter L. Ross, senior vice president of the Nickel Plate railroad, has been elected president to succeed J. J. Bernet who on Jan. 1 enters the office of president of the Erie railroad. C. E. Denney, vice president in charge of operations of the Nickel Plate succeeds Mr. Ross as chief of the Clover Leaf division of the Nickel Plate System.

* * *

D. W. Brunton, consulting engineer of Denver, and Zay Jeffries, metallurgical engineer of Cleveland, will receive, respectively, the William Lawrence Saunders medal and the James Douglas medal. The presentation will be made at the annual meetings of the American Institute of Mining and Metallurgical Engineers to be held in New York in February.

* * *

A. E. Schneider of Worcester, Mass., has become temporary head of the Litchfield Shuttle Co., Southbridge, Mass., following the resignation of George M. Cheney of Southbridge as treasurer and general superintendent. George A. Litchfield, vice president, becomes assistant treasurer. James D. Clarke, master mechanic and a superintendent, also has resigned.

* * *

Ambrose Swasey, president of Warner & Swasey Co., Cleveland, builder of turret lathes and precision equipment, and renowned as the designer and constructor of large telescopes, celebrated his eightieth birthday, Dec. 18 at his home in that city. Among the many telegrams and messages of congratulations he received was one from his partner, Worcester, Reed Warner, who was 80 years old last May.

British Business Is Expanding

Heavy Steel Mills Booked Over First Half—General Price Advance Contemplated for Finished Material—Full Pig Iron Output Not Expected Before End of January—More Countries Favor Joining Entente

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Dec. 21.—(*By Radio*)—The general situation of the British iron and steel industry shows considerable improvement. Heavy steel mills are booked over the first half of 1927. Rail mills in the Barrow district are scheduled to resume operations in January. A general advance in prices of finished steel is being considered by manufacturers. Some imports of German ship plates are noted. Continental billets at $29.72, delivered, are cheaper than British material, although there is little inquiry. Export business is dull.

Owing to continued scarcity of coke full production of pig iron is not expected before the end of January. Twenty-one furnaces on the northeast coast are operating.

Falling domestic prices, reluctance of consumers to close, and slower export business are the features of the French market. The Belgian market is quiet and easier, French producers competing for Belgian business. Inquiries from the United States for notched bars are reported.

The Czech, Austrian and Hungarian steelmakers have agreed in principle on joining the European steel entente when a quota totaling 2,000,000 tons annually is distributed to them.

British Mills Starting as Fuel Is Available

Prince's Chambers, Corporation St.
Office of IRON TRADE REVIEW,

BIRMINGHAM, Eng., Dec. 10.—(*European Staff Service*)—Now that work is being resumed in practically all the coal pits the iron and steel outlook is distinctly brighter. A noticeable feature was the very large attendance at the Birmingham iron exchange where buyers and sellers congregated in larger numbers than for many months past. Actual business was necessarily small, the high prices of coal being the governing factor of the market. Considerable cuts in industrial coal were announced, from 15s ($3.63) to £1 ($4.85) and a similar reduction was conceded for slack. Fuel supplies, however, are rapidly increasing and preparations for an early resumption of work are being made.

Sterling $4.85

The Staveley Coal & Iron Co. whose furnace started last week has now commenced selling iron and a parcel changed hands in Birmingham at about £4 12s 6d ($22.42), a high figure compared with prestrike rates, but a welcome reduction on the price of £6 ($29.10) paid lately for Middlesbrough iron when it could be got hold of. Cleveland No. 3 G. M. B. has been reduced today to £5 15s ($27.89) for prompt delivery. Contracts over six months however, are being arranged on a basis of £4 2s 6d ($20) but for shorter contracts up to the end of February £4 5s ($20.60) is named. Forward business in east coast hematite can be contracted at £4 10s ($21.82) per ton, but at present this material is not available.

Galvanized sheets have been reduced to £17 5s ($83.66) following the easing of the situation in regard to cheaper coal and more plentiful supplies. Sheet bars, however, continue scarce. Buying is much more keen, consumers who have been waiting for sometime showing anxiety to place their orders. In South Wales the volume of demand shows signs of

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 20	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$24.25	5 0 0*	$21.22	4 7 6	$21.22	4 7 6	$20.73	4 5 6
Basic	24.46	5 5 0	21.58	4 9 0	21.58	4 9 0	20.61	4 5 0
Basic-bessemer	24.25	5 0 0†	18.19	3 15 0	18.19	3 15 0	18.19	3 15 0
Hematite, Phosphorus 0.02-0.05	22.43	4 12 6	.....	740*	.....	.....	21.34	4 8 0
SEMIFINISHED STEEL								
Billets	$32.74	6 15 0	$25.22	5 4 0	$25.22	5 4 0	$25.68	5 6 0
Wire rods	43.65	9 0 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.58	7 15 0	$29.10	6 0 0	$29.10	6 0 0	$29.10	6 0 0
Merchant bars	1.73c	8 0 0	1.18c	5 9 0	1.19c	5 9 6	1.32c	6 0 0
Structural shapes	1.46c	6 15 0	1.18c	5 9 0	1.19c	5 9 6	1.29c	5 17 0
Plates, ship, bridge and tank	1.68c	7 15 0	1.40c	6 7 6	1.40c	6 7 6	1.54c	7 0 0
Sheets, black, 24 gage	2.38c	11 0 0	2.53c	11 10 0	2.53c	11 10 0	2.42c	11 0 0
Sheets, galvanized, 24 gage, corrugated	3.68c	17 0 0	4.68c	2,600*	.....	.....	3.74c	17 0 0
Bands and strips	2.38c	11 0 0	1.51c	6 17 6	1.51c	6 17 6	1.54c	7 0 0
Plain wire, base	2.11c	9 15 0	1.57c	7 2 6	1.57c	7 2 6	1.54c	7 0 0
Galvanized wire, base	2.76c	12 15 0	2.04c	9 5 0	2.04c	9 5 0	2.09c	9 10 0
Wire nails, base	2.06c	9 10 0	1.73c	7 17 6	1.73c	7 17 6	1.67c	9 12 0
Tin plate, base box 108 pounds	$ 5.34	1 2 0	.....	.....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs	Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$27.89	5 15 0	$24.24	600(2)	700	$19.55	85
Basic pig iron	25.46	5 5 0	23.84	590(1)	675	20.24	88
Furnace coke	9.70	2 0 0	8.32	206	270	4.95	21.50
Billets	32.74	6 15 0	31.71	785	800	27.49	119.50
Standard rails	1.73c	8 0 0	1.62c	900	1,000	1.46c	140
Merchant bars	1.89c	8 15 0	1.88c	880	1,015	1.40c	134
Shapes	1.68c	7 15 0	1.47c	815	1,015	1.37c	131
Plates, ship, bridge and tank	1.89c	8 15 0	1.76c	975	1,150	1.55c	149
Sheets, black, 24 gage	2.49c	11 10 0	3.80c	1,775	2,100	2.35c	225
Sheets, galvanized 24 gage, corrugated	3.73c	17 5 0	4.95c	2,750	3,500	3.65c	350
Plain wire	2.11c	9 15 0	2.97c	1,650	1,600	2.03c	195
Bands and Strips	2.49c	11 10 0	2.07c	1,150	1,250	1.62c	155

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 5s 0d ($6.06) f. o. b. Ferromanganese £16 0s 0d ($77.60) f. o. b. German ferromanganese £15 10s 0d ($75.18) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

broadening and the speeding up of production is likely.

In the tin plate trade business continues quiet, although a certain amount of inquiry is circulating. Consumers are looking for definite news regarding execution of existing contracts and for a fall in prices which it is thought is bound to occur. Makers are expecting a general restarting of mills at an early date and no doubt by the end of the vear production will have been augmented considerably. Bar mills will also start to roll as soon as steel becomes available. Prices are again easier. For February shipment business has been transacted on the basis of £1 3s 6d ($5.70) f.o.b. works, while for prompt plates £1 3s 9d ($5.76) to £1 4s 3d ($5.88) is quoted. Little inquiry exists for export. Tinplate bars are still officially quoted at £6 15s ($32.73), but few plates can be obtained under £7 10s ($36.37) per ton and the foreign quotation for bars stands at £6 3s 9d ($30).

High Franc Perils French Steel

PARIS, Dec. 10.—(*European Staff Service*)—Considerable anxiety is being manifested in iron and steel circles over the rapid rise of the franc. If the upward movement continues much further it soon will be impossible to sell French iron and steel in foreign markets. The upward movement of prices lagged behind during the period of depreciation and the same will be true in the opposite sense as long as revalorization is in progress. Costs expressed in terms of paper francs have risen to dizzy heights, and the fact that the franc now is worth nearly twice as much in gold as it was four months ago does not mean that wages and raw materials such as coal and coke have dropped proportionately in price. In fact, costs still are mounting and manufacturers who deal in export markets are predicting a panic unless government intervention checks the soaring franc. The reversal in exchange and the cessation of the coal stoppage in England will certainly deal a hard blow

Francs—$0.037

to France's export in iron and steel.

Pig iron production in France during October was 815,694 tons, a record for all time. The output for the first ten months of 1926 totals 7,775,900 tons, or an annual rate of 9,300,000 tons, as compared with 8,495,000 tons in 1925 and 5,200,000 tons in 1913 (Lorraine not included). Foundry No. 3 remains unchanged at 600 francs ($22.20) f.o.b. furnace. This quality was being sold in January of this year at 395 francs, or the equivalent of $14.80 at that time. No better example can be cited to illustrate the change which has occurred in French prices due to exchange fluctuations. It will be noted that the present price in gold is over 50 per cent higher than at the beginning of the year. The export prices of the Franco-Belge-Luxemburgoise syndicate is £4 5s ($20.55), but few sales are being recorded at this figure. Hematite prices remain unchanged. Export business is brisk.

Steel production during October was 741,748 tons, thus establishing a record. Semifinished steel prices are firm despite the fact that little tonnage is being placed. Merchant bars are being done around £5 11s ($26.85) f.o.b. Antwerp. Domestic tonnage is being offered by a Lorraine mill at 860 francs ($31.82), or 20 francs ($0.75) under last week's price. International competition for plate business is becoming keener. Tank plates are offered for export at £6 5s ($30.30). One Saar maker is quoting plates 5 millimeters thick for domestic consumption at 950 francs ($35.15).

Foundry business is slow. The automobile trade is dull and orders from this source are disappointing. Activities, however, in the north and Ardennes are holding up better than in the Paris district. An order for steel castings weighing 440 pounds each was placed with a Paris foundry at 6360 francs ($235) per metric ton.

Britain Buys Less from Continent

LONDON, Dec. 10.—(*European Staff Service*)—The immediate effect of the termination of the coal strike in Great Britain is a slowing down of iron and steel business between that country and the continent. British buyers are waiting developments before placing orders and only those who have immediate needs are induced to buy abroad, in which case they must be prepared to pay a price to secure anything like prompt delivery.

It probably is the smaller demand from Great Britain that has caused the continental market to weaken. Continental works now are keener to compete for business, which is concentrated specially upon semifinished steel. In this class of products deliveries extend to January next year. In the meantime, British engineering works and shipyards have lost no time in contracting orders with the British dominions and South America; some of these orders are substantial and will provide work for several months. In such a class are the contract for the underground railroad in Argentine captured by a London firm, and the contract for the Singapore dock awarded to Swan Hunter & Wigham Richardson of Wallsend- on-Tyne, valued at £20,000,000 ($97,000,000) and £1,200,000 (5,800,0000) respectively. On the other hand, some interesting orders for constructional steel have been lost to the continent, especially to Germany.

Seventy tons of pig iron were shipped from the Clyde river in the past two weeks. This is the measure of Britain's pig iron export trade at the end of the coal stoppage. Continental foundry pig iron 2.5 to 3 per cent silicon can be obtained at £4 5s ($20.60) per ton f.o.b. Antwerp, or £5 10s ($26.60) delivered Birmingham. It is French pig iron which mainly enters this district, although some business in German material also is reported to have been done. The French furnace operators are viewing with anxiety the future of their export business with Britain. It is not expected that the present price of £4 5s ($20.60) will prevail when supplies of British material become available. If the price were to drop to £4 ($19.45) f.o.b. Antwerp, which is quite likely in the near future, the French producer would receive only 470 francs ($18) at the furnace, whereas he can sell his product in the domestic market for 600 francs ($23). This is an illustration of the effects of the appreciation of the franc, which has gained about 90 per cent since July. Belgium, with a stabilized currency and shorter rail hauls, is in a better position. Germany also enjoys the advantages of a stable mark.

The steel market is easier, the only firm spot being semifinished steel. French and Belgian basic bessemer billets still are quoted at £5 6s ($25.70) f.o.b. Antwerp, but merchant bars have dropped from £5 15s ($27.90) two weeks ago to £5 11s ($26.95). A substantial business in semifinished steel is effected by Germany who can offer quicker delivery. Keen competition has developed in plates, the average quotation being £6 5s ($30.25).

Germany is competing strongly in the Belgian market and the Saar is taking some business in France. As blast furnaces are being blown in Great Britain steel furnaces also will gradually be put into commission. In the course of the next week it is expected that about ten blast furnace stacks will commence operating. However, it will take some time before steel requirements can be met by domestic producers and some continental material still will be ordered. Continental merchant bars can be delivered in the Midlands at between £6 15s and £7 ($32.75 and $34), beams from £7 to £7 5s ($34 to $35.35) and 3/16-inch plates at £7 15s ($37.55).

Steel Dividend Shows Faith

Forty Per Cent Common Stock Dividend to Holders Reflects Belief in Higher Earnings—Capitalizes Portion of Huge Surplus Built Up Over 25 Years and Now Estimated at $800,000,000

FOR the second time in its history and the first time since 1903 the United States Steel Corp. has announced a change in its capital structure through a 40 per cent dividend payable in common stock. The stock authorized to be issued by the board of directors has a par value of $100 and on that basis has a total par value of $203,321,000. It was considered as one of the most important financial developments of the year in that it implies faith on the part of those in control of the gigantic organization in the fundamental soundness of business conditions and in the ability of the corporation to expand its earnings and to deal more generously with stockholders.

In making public the dividend action Chairman Gary said:

"On the unanimous recommendation of the finance committee the board of directors has unanimously voted to recommend to the stockholders at the regular annual meeting of the corporation, to be held on the third Monday of April 1927, that the common capital shares of the corporation be increased by 2,033,210 shares, which is equivalent to 40 per cent of the present outstanding common shares, for the purpose of distributing the same as an extra special dividend to the common stockholders. It is believed that the property conditions and earning capacity of the corporation justify the proposed action at this time."

The decision to declare the dividend was of especial interest because this year the Corporation celebrated the 25th year of the organization. It came as a climax to months of rumor and speculation regarding the disposition the corporation would make in its huge surplus. This, it is estimated, will aggregate more than $800,000,000 at the close of this year, including $240,000,000 appropriated for plant extensions. Although no official information is available as to the rate of dividend to be carried by the new stock the statement "that the property conditions and earning capacity of the corporation justify the action" is taken to mean that the total distribution will be larger than at present. The present rate of payment is 7 per cent, making a total distribution on the issue of $35,581,000 annually.

In the first nine months of 1926 the United States Steel Corp. earned $66,000,000 available for its common stock and it is estimated that the year will show almost $90,000,000 available for its common stock. In 1925 there was $65,382,000 for common stock.

The capitalization and funded debt of the corporation in 1901, when it was incorporated, consisted of $508,302,500 of common stock; $510,281,100 in preferred stock $303,757,000 in United States Steel bonds, and $60,978,000 in subsidiary bonds. In 1903 the preferred stock was reduced to $360,281,100.

The present capitalization and funded debt of the corporation, as shown by the last available figures, at the end of 1925, consist of $508,302,500 of common stock, $360,281,100 of 7 per cent cumulative preferred stock; $350,926,000 United States Steel bonds, and $102,856,000 subsidiary company bonds; $54,554,900 bonds of subsidiary companies not guaranteed by the Steel corporation. The total funded debt at present is $506,005,578. At the end of 1925 the corporation had a surplus of $521,000,000 and $200,000,000 of surplus appropriated covering capital expenditures. In 1901 it had a net working capital of $156,000,000 of which $55,000,000 was in cash. At the end of 1925 the net working capital was $436,000,000 of which sum about $180,000,000 was in cash and in marketable securities.

Since 1901 the surplus of the corporation has grown from the nest egg of $25,000,000 to more than $500,000,000. The capacity of plants has more than doubled. The finishing capacity of the United States Steel Corp. in 1901 was 7,719,000 tons. In 1925 it was 16,251,000 tons. Despite the expenditure of hundreds of millions of dollars in improvements and extensions of plants the capital stock and funded debt of the corporation has increased but $7,000,000.

The gross amount of business of the Steel corporation, from April 1, 1901, to Dec. 31, 1925, was $16,863,351,000. The total net profits for the period was $2,000,178,912. Of the profits preferred dividends at the end of 1925 amounted to 173¼ per cent, totaling $647,709,784. Common dividends amounted to 125¼ per cent, an average of 5.2 per cent per year, making the total received by common stockholders, $631,544,000. Aggregate dividends of $1,279,253,000 were paid.

The corporation has 27 principal subsidaries and 165 underlying companies. The new stock dividend will give the company a stock capitalization of $1,071,6000,000, compared with $868,583,000 at the present time. The funded debt of the corporation is $506,000,000 so that the total capitalization of the corporation including common stock, funded debt and surplus will amount to $2,098,000,000.

The finance committee of the board of directors and all but three members of the board were present in Chairman Gary's office when the announcement of the dividend action was made, Dec. 16. George F. Baker, the venerable financier, sat on the right of Judge Gary and J. P. Morgan was near the directors' desk. In the group about the directors' table were William J. Filbert, comptroller of the company; Samuel Mather, head of Pickands, Mather & Co., Cleveland; Thomas Morrison of Pittsburgh, of the Carnegie Steel Co.; John Phipps of New York; William P. Palmer of Cleveland, president of the American Steel & Wire Co.; Percival Roberts Jr., Philadelphia; Myron C. Taylor of New York; Eugene Bufington, president of the Illinois Steel Co., and President James A. Farrell of the United States Steel Corp.

Record Shows Growth

End of year	Balance of undivided surplus of United States Steel Corp.	**Dividends paid during each year
*1901	$ 43,620,940	$ 41,979,168
1902	77,874,597	56,052,867
1903	55,724,879	43,111,735
1904	52,247,978	25,219,677
1905	69,313,794	25,219,677
1906	79,556,654	35,385,727
1907	94,736,490	35,385,727
1908	105,079,477	35,385,727
1909	120,401,395	45,551,777
1910	130,438,718	50,634,802
1911	133,691,195	50,634,802
1912	136,716,245	50,634,802
1913	151,798,428	50,634,802
1914	135,204,471	40,468,752
1915	180,025,328	31,573,458
1916	381,360,913	69,696,145
1917	431,660,803	116,714,127
1918	466,888,421	96,382,027
1919	493,048,201	50,634,802
1920	523,454,890	50,634,802
1921	508,926,957	50,634,802
1922	499,139,414	50,634,802
1923	512,751,219	54,447,069
1924	517,061,308	60,800,852
1925	521,863,109	60,800,852

*Nine month. **On common and preferred stocks.

Obituaries

HARRY M. GILES, general superintendent at the South Philadelphia plant of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., died at Atlantic City, N. J., Dec. 14. Mr. Giles was born 57 years ago at Boothbay, Me., and received his education at the Prospect Union, Cambridge, Mass. He began his career as testing engineer for the Corliss Steam Engine Co., Providence, R. I. In 1886 he became chief engineer of the Calumet & Hecla Mining Co. and in 1900 superintendent of the corliss engine department of the Westinghouse company. His next promotion was to the post of marine superintendent and in 1919 he was appointed general superintendent of the South Philadelphia plant.

* * *

William J. Wolf, 38 years old, treasurer of the Waterbury Farrell Foundry & Machine Co., Waterbury, Conn., died recently after an operation for appendicitis.

* * *

James King Hoyt, senior partner of A. Milne & Co., 745 Washington street, New York, dealers in steel and iron, died Dec. 15 at his home in New York. He was aged 65.

* * *

Frank W. Cabble, president of the Wm. Cabble Excelsior Wire Co., Brooklyn, N. Y., touring the South for his health, died in Richmond, Va., Dec. 13, aged 54 years. He was a trustee of the Bushwick Savings bank and Brooklyn Rotary club.

* * *

Alfred R. Buchholz, president of the Crown Machine Co., Milwaukee, died suddenly in a physician's office on Dec. 14, from the effects of an injury to his head sustained several weeks before when struck by an automobile. He was 44 years of age.

* * *

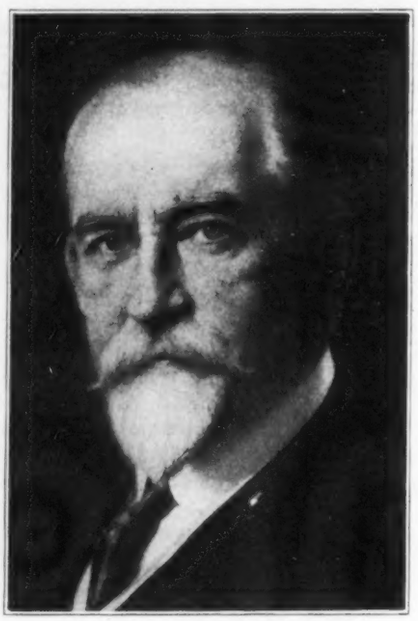
Waldo C. Briggs, engineering superintendent for Henry Steers Inc., New York, dropped dead in that city Dec. 13. Mr. Briggs was a Yale graduate and was in charge of the construction of many important structural undertakings in the metropolitan territory. He was 56 years of age.

* * *

Harold E. Lehman, 32 years old, experimental engineer for the Auburn Motor Car Co., Auburn, Ind., died recently in Indianapolis after a short illness. He was born in Indianapolis, was a graduate of Purdue university and a member of several automotive societies. Formerly he was sales manager of the Wheeler-Shebler Carburetor Co., Indianapolis.

* * *

Charles F. Brooker, chairman of the board of the American Brass Co., Waterbury, Conn., died at his winter home at Lakeland, Fla., Dec. 20. He had been ill for some time. Mr. Brooker was a leading figure in the brass industry, with which he had been connected actively since 1864. Then at the age of 17, he entered the employ of the Coe Brass Co., Torrington, Conn., one of the present plants of the American Brass Co. He became secretary of this company in 1876 and in 1893 became president upon the death of Lyman W. Coe. When the Coe company was merged with several other brass producers into the American Brass Co., Mr. Brooker became the first president of this company and was the principal figure in bringing about the amalgamation. He continued as president of the company until about seven years ago when he was elected chairman of the board. Mr. Brooker played a leading part in the negotiations which led to the absorption of the stock of the American Brass Co. by the Anaconda Copper Mining Co. New York, about four years ago.



CHARLES F. BROOKER

* * *

William Corry, for 22 years vice president of the Chrome Steel Works, Carteret, N. J., died at Cincinnati, Dec. 15, where he had made his residence since his retirement some years ago. A cold contracted about seven weeks ago brought about complications which caused his death. Mr. Corry was 84 years of age. Prior to going with the Chrome Steel Works he had been superintendent of Herring-Hall-Marvin Co., safe manufacturer, Cincinnati.

* * *

William H. Wyman, chief engineer of the Pine-Ihrig Co., Oshkosh, Wis., specializing in the manufacture of complete machinery and equipment for the match industry, died recently as the result of a fall, at the age of 74 years. He learned the machinist trade and then became mechanical engineer for the Wisconsin Match Co., Oshkosh, now one of the largest branches of the Diamond Match Co. Ten years ago he joined the Pine-Ihrig Co. as designing engineer. In 1922 he spent nearly a year at Canton, China, supervising the installation of a complete match plant, designed by him and built by the Oshkosh company. Living conditions in China seriously affected his health, he being then 70 years of age, but he was active in his office up to the day of his death.

* * *

Albert Harvey Hitchcock, aged 70, editor and publisher of business publications, died Dec. 11 at Mountain Lakes, N. J., where he had been on vacation. Mr. Hitchcock lived in Chicago. In 1899 he established the *Machine List* and later *Hitchcock's Machine Tool Blue Book*. He also was publisher of the *Stock List*. Mr. Hitchcock was born in Troy, N. Y., and went to Chicago in 1875. Starting on the editorial staff of the *Northwestern Lumberman*, he became managing editor. Later he became owner of the *Timberman*, editor of the *National Laundry Journal* and founder of *Hardwood*.

A non-slip cotter pin for draw bar keys has been devised by a Chicago, Milwaukee & St. Paul railroad engineer and is expected to go far toward eliminating derailments.

Machinery

Attention Now Is Focused on Revival of Business After the First of the Year—December Sales Are Disappointing

BUSINESS in machine tools and shop equipment is decidedly slow except in a few isolated cases. With no improvement to be expected during the holiday season, all eyes are being focused upon activity after the first of the year. All in all, there seems to be a good volume of business tied up in current inquiries but with all interests showing a decided intention of delaying action, consequently sales in January should be large. Sales in December have been in sharp contrast to those of December one year ago, when both inquiries and sales were at a high point. Likewise, crane sales were good, this year, there has been inactivity for about two months. Although no increases are expected, present prices seem quite firm.

New York, Dec. 21.—Although orders continue to come through slowly, prospects for the early part of next year are promising. Few large lists are noted, but volume of pending inquiry is considerable. Among the scattered orders are a 22 x 27-foot engine lathe and a set of 8-foot plate bending rolls for Norfolk & Western, which interest, as previously noted, is in the market for a substantial quantity of equipment. Illinois Steel Co., Chicago, noted in last week's issue as placing a substantial list with Niles-Bement-Pond Co. has closed on three additional 24-inch shapers to this builder. Illinois Steel Co.'s total purchases from Niles and other companies, are understood to run well over $100,000. Crane demand is the slowest in many weeks, reflecting holiday influences.

Boston, Dec. 21.—Current tool sales are quiet, but the month nevertheless is running ahead of December, 1925, and the year's total for many dealers is close to the high mark. Chapman Valve Co., Springfield, Mass., is buying actively against a sizable list. Orders are expected for at least four or five additional tools before the end of the year. Tool manufacturers within the district practically all report excellent business for the year. Unfilled orders at the moment have dropped to a low point, but much new work is in sight. Grinding tools in particular have been in strong demand. Prices generally are firm.

Worcester, Mass., Dec. 21.—Machine tool castings are being produced in greater volume, the demand from the textile mills for replacements being on the gain. Machine shops also are in the market for an increased volume of materials and small tool business is better. A large order from a group of Rhode Island textile mills has been received. The year will close with a bright outlook for the new year.

Pittsburgh, Dec. 21.—Most sellers note a falling off in inquiries although one or two large machinery and supply houses find business this December better than a year ago. A number of manufacturers appear to be closing on machinery asked for two or more months ago. Crane sellers report an almost total lack of buying, compared with fairly good buying in December, 1925. Occasional small orders are placed for needed items. Norfolk & Western railroad bought a bending roll and a lathe; Westinghouse Electric & Mfg. Co., is buying piecemeal but probably will throw into its first quarter list items not yet placed on this quarter's inquiry; Pennsylvania bought some used grinders for round houses but has not closed on the heavy plate-working equipment recently asked for for Altoona, including two large squaring shears. The latter items will represent an investment of $8000 or $9000 apiece. Some of the pending propositions include American Sheet & Tin Plate Co., Gary, Ind.; Shenango Furnace Co. for mold plant machine shop, Sharpsville, Pa.; Valley Mould & Iron Corp. mold plant, machine shop for Hubbard, O.; Erie Malleable Iron Co. expanding its wheel foundry at Erie, Pa.; and a few local interests which are adding to foundry and machine shop equipment items, the need for which has been demonstrated by inventories completed or in progress.

Chicago, Dec. 21.—Sellers continue to report a low volume of sales. With various end-of-the-year activities taking the time of prospective buyers, sales efforts of dealers are tapering off until the dawn of 1927, when they look for a revival of demand. Inquiries also are meager and like sales, usually specify only one or two items. No new lists are out and the only one outstanding, that of Pullman Car & Mfg. Co., undoubtedly is being held over for the 1927 budget. Shipments for December, however, probably will hold up to the November total. Prices are firm and steady and, while it is unlikely that there will be any advances now, there is no weakness. The used tool market is in good shape, although inquiries for rebuilt tools in stock is none too good. Neither are dealers anxious to participate heavily in public auctions of machinery at this time of year.

Cincinnati, Dec. 21.—As the year draws to a close, production of machine tools declines as manufacturers are entering little new business on their books. The present situation is expected to exist until after the middle of next month, when users start buying for replacement purposes. Sales the past week were of small consequence, involving single tools and inquiries pending are of a like nature. Railroads and other tool buyers are waiting until after the inventory period before they make new purchases. In the used machinery line the same conditions prevail.

CRANE ORDERS PLACED

Three cranes, including two 10-ton and one 5-ton, for Norfolk & Western railroad, Roanoke, Va., to Whiting Corp.

Two 30-ton locomotitve cranes for an eastern company to Browning Crane Co.

Two cranes, including a 2-ton special jib crane and a 1-ton special post crane, and a 300-foot monorail system, for a steel company in the metropolitan district, to New Jersey Foundry & Machine Co.

Among single orders were: 50-ton crane for Elliott Co., Jeannette, Pa., to Niles Crane Corp.; a used crane for West Leechburg Steel Co., West Leechburg, Pa., to unnamed seller; 25-ton handpower crane for Utility Power & Light Co., Chicago, to Whiting Corp.; 30-ton handpower crane for Public Service Co. of New Hampshire, Manchester, N. H., to Whiting Corp.; 20-ton used locomotive crane for Atlantic Creosoting Co., Norfolk, Va., to Hoisting Machinery Corp.; 25-ton locomotive crane for an eastern concern, to Browning Crane Co.; 8-ton overhead crane for Clifton Paper Mills Co., Clifton, N. J., previously noted as placed, awarded through Karl A. Lefren, New York, to Chisholm-Moore Mfg. Co.

CRANE ORDERS PENDING

Locomotive crane for Borough of Queens, New York; bids asked.

Beehive Coke Output Is Shrinking

Beehive coke production in the week ended Dec. 11 fell to 184,000 net tons, from 191,000 tons in the preceding week and 288,000 tons in the comparable week of 1925. For the year to date, however, coke production totals 11,017,000 tons, against only 9,901,000 in the same period last year. Bituminous coal production in the week ended Dec. 11 totaled 14,122,000 tons; in the preceding week it was 14,676,000 tons. For the year to date output is 544,302,000 tons, or 54,000,000 tons ahead of last year.

ESTIMATED PRODUCTION OF BEEHIVE COKE (Net tons)

	Week ended Dec. 11, 1926b	Dec. 4, 1926c	1926 to date	1925 to date
Pa. & Ohio..	148,000	154,000	8,951,000	7,638,000
W. Va.	15,000	14,000	736,000	609,000
Ala., Ky., Tenn. & Ga.	6,000	8,000	582,000	883,000
Va.	6,000	6,000	335,000	357,000
Colo. and N. M.	5,000	5,000	244,000	229,000
Wash. and Utah	4,000	4,000	169,000	185,000
U. S. Total	184,000	191,000	11,017,000	9,901,000
Daily av.....	31,000	32,000	38,000	34,000

(a) Adjusted to make comparable the number of days in the two years. (b) Subject to revision. (c) Revised since last report.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

STONE & WEBSTER INC., and Blodgett & Co., New York, have formed a new company known as Stone & Webster and Blodget Inc., to take effect Jan. 1, 1927, with an authorized capital of $10,000,000. The new corporation is a combination of the securities department of Stone & Webster Inc., and the old investment house of Blodget & Co. The engineering and construction, management, and investigating departments of Stone & Webster, Inc., are not included and will not be affected by the combination.

* * *

LITCHFIELD SHUTTLE CO., large manufacturer of textile shuttles, Southbridge, Mass., has recently been reorganized. Operations have been placed under the direction of A. W. Schneider, Worcester, Mass. George M. Cheney, formerly treasurer and general superintendent, and James D. Clark, master mechanic and superintendent, have resigned.

* * *

OSHKOSH MOTOR TRUCK MFG. CO., Oshkosh, Wis., has applied for a receivership and W. G. Maxcy of Oshkosh has been appointed to take full charge of the affairs. Authority is given the receiver to continue the plant in operation, there being a substantial volume of orders on the books. Immediate working capital will be provided by the issuance of receiver's certificates. The Oshkosh company was established about ten years ago to manufacture four-wheel drive trucks.

* * *

TEXTILE mills at Ware Mass., will probably be saved as a result of agitation started when the Otis Co. management threatened to close the plant and move operations to southern territory. The Otis Co. has appointed a committee to investigate the problem and the preliminary report states that by increasing the production of fine material at the Ware plant and transferring coarse material production to some other point an efficient scheme of operation can be obtained. The plant at Ware employs 2000 workers.

* * *

STOWELL CO., South Milwaukee, Wis., malleable castings and hardware, lost part of its plant by fire Dec. 4, necessitating suspension of operations. It is not known if the plant will be rebuilt, as it has been in charge of creditors for more than a year, with Fred L. Sivyer, president of the Northwestern Malleable Iron Co., Milwaukee, as trustee. Virtually all of the equipment and machinery was wrecked by heat and water, and the buildings, including the main foundry, badly damaged. The plant is one of the oldest malleable foundries in the Middle West.

* * *

WORK has been started by the Bucyrus Co., South Milwaukee, Wis., on the construction of one of the largest oil-electric hydraulic dredges that has ever been designed, according to G. A. Morison, vice president. It will be equipped with four diesel engines of 1150 horsepower each, and two 60-horsepower auxiliary engines. The cutter head will have a diameter of 8 feet and the pump is driven by a motor rated at 3000 horsepower. There recently has been placed in service in New York harbor a Bucyrus oil-electric dipper dredge with main diesel engines of 1200 horsepower to generate power for operating forty electric motors.

* * *

THE Dravo interests have acquired from the Pittsburgh & Lake Erie and the Pittsburgh & West Virgina railroads, for the Keystone Sand Co., at Pittsburgh, 94,000 square feet in two parcels, one between South Third street and the new Liberty bridge, and the other between the Pittsburgh & Lake Erie railroad and the Monongahela river.

The property is to be improved by a loading dock, warehouse and distributing yards. The dock will be equipped with modern loading and unloading machinery. Deliveries can be effected by rail, river or truck. Other portions of the property will be improved by storage bins, warehouses, and a yard for retail distribution.

* * *

ACCORDING to a recent statement by an official connected with the New Orleans Permanent Industrial Trade Exhibition, which opened February at New Orleans, this exhibition during the past year has proven of material aid to the expansion and development of the export business of southern manufacturers, not the least of which has been iron and steel products made in the southern district.

Among companies exhibiting, identified with the metal industries, are International Harvester Co.; Hercules Powder Co.; McCray Refrigerator Co., Kendalville, Ind.; Lukens Steel Co., Coatesville, Pa.; Newport Rolling Mill Co., Newport, Ky.; National Tube Co.; Diebold Safe & Lock Co., Canton, O.; United States Steel Products Co., New York, with a display of the products of the Carnegie Steel Co., American Steel & Wire Co., American Sheet & Tin Plate Co., Illinois Steel Co., Lorain Steel Co., Minnesota Steel Co., Shelby Steel Tube Co., Tennessee Coal, Iron & Railroad Co., and American Bridge Co.

Iron, Steel Employment Off in November

Washington, Dec. 21.—The iron and steel industry, which has been operating on a satisfactory employment basis, showed a slight recession in November, says the employment service of the department of labor.

"The volume of building throughout the country," says the bureau "declined somewhat, and in many localities, for the first time in months, the supply of buidling tradesmen was greater than the demand and a growing surplus of this class of help exists in some cities.

"Automobile factories and accessory plants temporarily reduced their forces; however, all indications point to a recalling of these workers in the near future.

"The anthracite mines are operating on satisfactory schedules, affording steady employment to these miners. In the bituminous fields of the country production and employment showed a large increase.

"A noticeable reduction in employment was apparent in the last ten days of the month. This was largely due to the termination of much seasonal work."

The Coates Clipper & Mfg. Co., Worcester, Mass., has recently been reorganized. Albert W. Darling is president and general manager. E. H. Reed is treasurer and M. C. Nelson is clerk. The company manufactures flexible shafting and machine clippers.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

Where additional information is presented, reference is made to date of issue in which previous item appeared.

BIRMINGHAM, ALA.—Stockham Pipe Fitting Co., 4100 North Tenth avenue, has let contract to H. K. Ferguson Co., Cleveland, for a pipe shop and general repairs and additions to its plant.

BIRMINGHAM, ALA.—Birmingham Fabricating Co., 112 South Twenty-second street, is erecting two 1-story buildings 90 x 90 feet and 86 x 90 feet for the manufacture of ornamental iron goods and wire products. I. H. White and C. F. Hyrne are owners.

BIRMINGHAM, ALA.—Southern Steel & Rolling Mill Inc., 3900 Tenth avenue, M. J. Gerson president, manufacturer of reinforcing bars, is remodeling its plant. Main building will be increased to 100x290 feet with wing 60x100 feet.

GADSDEN, ALA.—A. & J. Mfg. Co. will build an addition to its main foundry 80x100 feet and warehouse 80x130 feet.

LOS ANGELES—United Casting Co., 821 Wilson street, will build a 1-story foundry 40 x 60 feet.

LOS ANGELES—C. F. Braun & Co., Alhambra, Calif., is building five shop additions on its 28-acre site and has let contract for an office building with 55,000 square feet of floor.

LOS ANGELES—Sproat Brass Foundry Co. has leased three acres additional adjoining its plant from the Ward Heater Co., Samuel Sproat, president, and will build an addition to supply the latter with its brass requirements.

HARTFORD, CONN.—Capital Foundry Co., F. W. Stickle president, will rebuild burned portions of its plant.

MERIDEN, CONN.—Meriden Knife Co. will build a 1-story addition to the plant of the Miller Bros. Cutlery Co., which it recently bought.

WALLINGFORD, CONN.—Ives Co., manufacturer of tools and woodworking machinery, will build a 1-story plant 60 x 240 feet to replace a recent fire loss.

ANTIOCH, ILL.—Ahlberg Bearing Co., Chicago, has bought 35 acres here and is considering erecting a plant on it.

BLUE ISLAND, ILL.—Commercial Motors, 432 Western avenue, has been incorporated with $20,000 capital to manufacture automobiles, motorcycles and motor vehicles by Edgar J. Schroth, Wilbur N. Schrith and Roy D. Crist. Paul T. Klent, 746 Otis building, 10 South LaSalle street, Chicago, is attorney.

CHICAGO—O. P. Wodack, 5220 North Mozart street, will build a 1-story machine shop 50 x 120 feet from plans by Charles Dewey, 4800 North Kedzie avenue.

CHICAGO—Standard Stamping & Perforating Co., room 421 New Era building, will build a 2-story plant at 4715 Fifth avenue, 25 x 122 feet from plans by J. T. Porter, New Era building.

CHICAGO—Heuer Bros. Inc., 1510 Blue Island avenue, has been incorporated with $25,000 capital to manufacture automoboile bodies by Arthur Heuer, George J. Heuer, and Elsie Deeg. James L. Kostka, 155 North Clark street, is correspondent.

CHICAGO—Johnson Shuttle Co., 215 West Superior street, manufacturer of attachments for sewing machines and other devices, has let contract to John Lundberg, 5240 North Sawyer avenue, for a 1-story addition 75 x 125 feet.

CHICAGO—American Prism Co., 1305 South Fifty-fifth court, has been incorporated with $25,000 capital to manufacture sidewalk and vault lights, fire doors, ventilators and skylights by E. P. Kelly, R. F. Robinson and J. J. Ohlis. James E. McGrath, 7 South Dearborn street, room 1522, is correspondent.

CHICAGO—Viking Automatic Sprinkler Co., 450 East Ohio street, has been incorporated with $10,000 capital to manufacture automatic sprinkler devices and equipment heating and power equipment and water supply systems By E. S. Thomson, J. M. Thomson, E. Tyden and A. E. Thomson. E. S. Thomson, 450 East Ohio street, is attorney.

CHICAGO—M. A. Richardson, Inc., 741 Boston avenue, has been incorporated with $20,000 capital to manufacture metalware, tinware, sheet iron, and copperware by M. Arthur Richardson, Jessie S. Richardson and Marvin A. Richardson. Everett A. Aborn, 130 North Wells street, room 1203, is correspondent.

DWIGHT, ILL.—Coleman Hardware Co. will rebuild its burned pattern department.

HOOPPOLE, ILL.—Hooppole Mfg. Co. has been incorporated with $50,000 capital to manufacture farm appliances and other products by Charles M. Yager, Henry J. Salzman, J. H. Blackert, Jacob Cantlin, Rock Falls, Ill., is correspondent.

WAUKEGAN, ILL.—J. S. Heath Co., Market street, brass and bronze products, will build a 1-story addition 100 x 250 feet. R. O. Allexan is general manager.

SHELBYVILLE, IND.—B. V. & O. Engineering Service Inc. has been incorporated to deal in foundry and machine shop equipment by Walter O'Neal, Emmet L. vanDolson and William H. Bauch.

INDEPENDENCE, KANS.—Roth & Faurot Gasoline Co. is installing a gas booster station on its properties south of Independence and has contracted with National Supply Co. for two units of 185 horsepower gas engines and compressors.

COFFEYVILLE, KANS.—North American Car Corp. has added a fabricating department at its plant for fabrication of oil field storage tanks, also installed a 5-ton electric traveling crane. C. B. Tenhagen is in charge of the new department.

COFFEYVILLE, KANS.—Midwest Brass Mfg. Co. is erecting 50 x 120 corrugated iron and brick building for pattern shop and storage plant, also 40 x 80 machine shop for manufacture of valves and fittings, at Fourth and Santa Fe streets. Furnace equipment will consist of six oil-fired brass furnaces with daily capacity of 2400 pounds each. Asa F. Corner is manager.

FORT SCOTT, KANS.—Fort Scott Foundry & Machine Co. has added an electric arc welding department to its plant.

GALESBURG, KANS.—Shaw Mfg. Co., manufacturer of farm tractors and auto machinery, has placed contract with Parsons Foundry & Machine Co. for 600 cast iron tractor wheels involving 45 tons of material.

KANSAS CITY, KANS.—Russell Steel Products Co., John J. Russell president, recently incorporated with $50,000 capital, has moved into its new plant and started production of metal casement and basement windows.

PITTSBURGH, KANS.—Kelly-Carter Coal Co. has placed order with Marshall Supply Co. for an electric driven portable air compressor, for mining work.

LAFAYETTE, LA.—General Contracting Co., San Antonio, Tex., has contract for construction of three-story concrete and steel courthouse and jail building at bid of $215,391.

NEW ORLEANS.—New Orleans Public Service Co. has awarded contract to J. A. Petty & Sons, Godchaux building, for construction of gas meter station at Magnolia and Poydras streets.

BALTIMORE—Mahon & Gall Inc. has been incorporated to manufacture stationary and marine engines, with $10,000 capital, by John J. Mahon and associates.

BALTIMORE—Bartlett-Hayward Co., 200 Scott street, will build two 1-story additions 26x28 feet and 48x56 feet. General contract to Morrow Bros., Fidelity building.

PHILADELPHIA—The department of city transit has opened bids on substations to be erected at Louden and Carlisle, and Cumberland and Park streets.

WILLIAMSPORT, MD.—Contract for structural steel has been awarded to the Fort Pitts Bridge works for a power house addition here.

BOSTON—New York Electrical Co. has been incorporated with $25,000 capital to manufacture electrical supplies by George A. Barker president, 205 Hunnewell street, Newton, Mass.; I. Edwards Biller, 25 Temple street, Boston, and David Lasker clerk.

FALL RIVER, MASS.—Thomas A. Phelan Co., 148 Central street, is having plans made for repair and rebuilding of its warehouse and machine shop recently burned.

GARDNER, MASS.—E. W. Pierce & Chesworth Inc., manufacturer of machinery, is having plans made for repairs and rebuilding of its 3-story plant 42 x 111 feet, recently burned.

MILLBURY, MASS.—Bilt Rite Oil Burner Co. has been incorporated with $10,000 capital and 2000 shares no par value to manufacture oil burners and equipment by Eric Jacobson president and treasurer, Millbury, Mass., and Francis H. Dewey, Minna, Mass.

SOMERSET, MASS.—The power plant of the Montaup Electric Co. here will be doubled in size during 1927 at a cost of about $4,000,000. The company now provides power

to Fall River, Mass., Brockton, Mass., Pawtucket, R. I., and Woonsocket, R. I.

BENTON HARBOR, MICH.—William Moulds Foundry Co., manufacturer of brass and bronze castings will build a 1-story addition to its plant.

DETROIT—American Piston Co. is making plans to establish a plant at Tecumseh, Mich., and move its business there in larger quarters.

DETROIT—Peninsular Stove Co. is having plans drawn by Albert Kahn, architect, for a new factory building.

DETROIT—Kurth & Knapp Mfg. Co. has been incorporated with $30,000 capital to operate an industrial steel business by W. J. Kurth, G. E. Couse and M. V. Knapp, 202 Coplin avenue, Detroit.

FLINT, MICH.—Buick Motor Co. will build a foundry plant with capacity of 500 tons per day on a 12-acre site. Pattern storage and cleaning buildings are now under construction.

GRAND RAPIDS, MICH.—Wolverine Bumper Co., 1921 Broadway, will build a 1-story addition to its plant to increase production facilities.

MUSKEGON, MICH.—Lakey Foundry & Machine Co., Herman A. Becker president and general manager, will rebuild burned portion of its plant.

KANSAS CITY, MO.—Turner-Warner Screw Co., manufacturer of metal screws, has reincorporated and increased capital stock from $10,000 to $50,000. R. G. Warner is vice president and general manager.

BAYONNE, N. J.—Atlas Steel Barrel Co., Second street and Boulevard way, has let contract to Tilt-Hargan Co., 90 West Broadway, New York, for a 1-story addition to its plant.

CLIFTON, N. J.—DeMattia Foundry & Machine Co., 6 Monroe street, manufacturer of machinery for rubber mills, will build two additions, one to be used as an assembly plant. Its new foundry 96 x 240 feet, has been completed.

DUNELLEN, N. J.—Richard Hoe & Co., manufacturers of printing presses and saws, have awarded the general contract for a machine shop addition here to the Wigton Abbott Corp., 552 West Twenty-third street, New York City. The proposed extension will be one and two stories high, 75 x 100 feet.

HALEDON, N. J.—Contract has been recently let for a $30,000 plant addition, two stories high, 40 x 100 feet, for the National Woven Label Co.

NEWARK, N. J.—Ropke Pan & Mfg. Co., Los Angeles, manufacturer of tinware, has leased a 2-story plant at 161 Ogden street, 80 x 100 feet, for use as a branch plant.

NEWARK, N. J.—The Mono Service Co. has acquired property at 301-351 Oraton street for further expansion. New construction is likely to be undertaken during the coming year.

NEWARK, N. J.—Automotives Inc. has been incorporated with 400 shares no par value by William S. Taylor and C. B. Taylor, New York; Paul M. Lockwood, Newark. Corporation Trust Co., Jersey City, is attorney.

ORANGE, N. J.—Middletown File Co. has been incorporated with $275,000 capital to manufacture files, rasps, tools and machinery by John Galloway and associates.

PATTERSON, N. J.—Kuenneth Universal Productions Inc. has been incorporated to manufacture automotive accessories with $125,000 capital by George W. Kuenneth, Jeanette Kuenneth, Paterson; Fred Roeger, New York. R. West, New York, is attorney.

WESTWOOD, N. J.—Vigoradium Corp. has been incorporated with $50,000 capital and 1000 shares no par value to manufacture machinery by Joseph Barbato, Union City, N. J.; Paul Pascarella, Emerson, N. J., Catherine A. Feeley, Brooklyn, N. Y. Frank Pascarella, New York, is attorney.

ALBANY, N. Y.—Falcon Refrigeration & Engineering Co. has been incorporated with $50,000 capital and 600 shares no par value by J. H. Cunningham, H. A. Stone and F. A. Dickinson. J. L. Haggerty, Albany, N. Y., is attorney.

BROOKLYN, N. Y.—Brooklyn Edison Co. will build a 6-story building for office, shops and warehouse at First street and Third avenue and a 6-story garage adjoining.

BROOKLYN, N. Y.—Eastern Lubricator Co. has been incorporated with $4500 capital by H. Duke, R. Leibowitz and D. Goetz. I. Goetz, 15 Park Row, New York, is attorney.

BROOKLYN, N. Y.—Steinlighting Fixture Co. has been incorporated with $10,000 capital to manufacture lighting fixtures by W. Stein, R. W. Levy and T. Schoenfeld. M. J. Silver, 44 Court street, is attorney.

BROOKLYN, N. Y.—Brown & Finerman Iron Works has been incorporated with $10,000 capital by J. H. Briskman, S. Brown and A. Finerman. Uviller & Wiener, 350 Stone avenue, Brooklyn, are attorneys.

BROOKLYN, N. Y.—Broadmont Starter, Lighting & Ignition Co. has been incorporated with 200 shares no par value by H. O. Godnick, B. Godnick and R. Garcia. J. A. Freedman, 32 Court street, is attorney.

BROOKLYN, N. Y.—B. Lane & Epstein has been incorporated with $20,000 capital to handle steel and metal by T. Lane, B. Lane and B. Epstein. L. Pugh, 165 Broadway, New York, is attorney.

BUFFALO—Buffalo Model & Supply Co. has been incorporated with $15,000 capital to manufacture locomotive models by S. W. Karmolinski, R. D. Barr and J. F. Olejniczak. G. F. Killmer, Buffalo, is attorney.

HILLSDALE, N. Y.—Hillsdale Plow Co. will rebuild the burned portion of its plant. William A. Mallory Jr., is president.

JAMESTOWN, N. Y.—Rane Tool Co. has been incorporated with $50,000 capital by J. NcNeil and H. J. Randall. W. C. Proce, Jamestown, N. Y., is attorney.

LOCKPORT, N. Y.—Public Machine Corp. has been incorporated with $10,000 capital to manufacture vending machines by C. A. Saunders, H. L. Thurston and D. J. Thurston. Stockwell, Campbell & Warren, Lockport, N. Y., are attorneys.

NEW YORK—Standard Faucet Works has been incorporated with $25,000 capital by G. L. Bell, and W. J. Gill. J. B. Kilburn, 95 Liberty street, is attorney.

NEW YORK—Overland Metal Novelty Co., 141 Wooster street, will remove its plant to 233 Spring street where larger quarters and added equipment will allow increased output.

NEW YORK—Commissioner of plant and structure, Municipal building, is having plans drawn for an automobile service, repair and

Industrial Business Changes

BOWRING & CO., 17 Battery place, New York, have been appointed sales agents for the Benzon Fluorspar Co., with mines at Cave-in-Rock, Illinois. G. F. Murray is in charge of the ores and metals Department of Benzon Flourspar Co. The flourspar mined by the Benzon Flourspar Co. formerly was marketed by Rogers, Brown & Crocker Bros., Inc.

* * *

Pyrites Co. Ltd. has moved its offices to 2350 Madison aveune, New York, in charge of Augustus D. Ledoux.

* * *

LaSalle Steel Co., Chicago, has moved its offices from 2304 South Halsted street to 844 Rush street.

* * *

Wallace Machinery & Tool Co., Indianapolis, Ind., has established a plant at 470 Massachusetts avenue.

* * *

Danly Machine Specialties Inc., has moved its offices from 4911 North Lincoln avenue, Chicago, to its plant at 2104 South Fifty-second avenue, Cicero, Ill.

* * *

Kingsbury Mfg. Co., Keene, N. H. has organized the Kingsbury Machine Co. as a division to assume charge of production of milling machines.

* * *

Hanover Engineering Co., Hanover, Pa., has bought the business of the General Gas-Electric Co. of the same place and will continue production of its line of products and do general machine work.

garage building for city trucks at 530 East Seventy-fourth street.

NEW YORK—Prator Mfg. Co. has been incorporated with $100,000 capital to manufacture radio accessories by V. H. Kraus, A. J. Lakaiti and L. Feingold. J. L. Stoneham, Long Island City, N. Y., is attorney.

NEW YORK—Luxor Wrought Iron Works Co. has been incorporated with $10,000 capital by A. H. Kaufman, C. Scholnikoff and P. Livoti. M. Engel, 51 Chambers street, is attorney.

NEW YORK—Advance Equipment Distributers has been incorporated with $5000 capital to handle machinery by V. Levinson, D. Levinson and A. Mann. S. Mann, 15 Park Row, is attorney.

NEW YORK—Societe Petrometal has been incorporated with $50,000 capital to manufacture metals. A. J. Leo, V. J. Leo and S. Riegler. S. Shabshelowitz, 455 Seventh avenue, is attorney.

NEW YORK—Karl H. Croft has been incorporated with 1000 shares no par value to produce mechanical devices by E. H. Croft, T. P. Hall and S. Joseph. C. M. Hall, 305 Broadway, is attorney.

NEW YORK—Sagamor Metal Goods Corp. has been incorporated with $100,000 capital to manufacture machinery and tools by A. Schneider, S. Morrison and G. Gussoff. B. E. Kopelman, 280 Broadway, is attorney.

NEW YORK—Marnall Steel Co. has been incorporated with $50,000 capital to manufacture motors and engines by A. R. Tritschler and W. Kessler. G. Hoerner, 220 West Forty-second street, is attorney.

NEW YORK—Bronze Weather Strip Corp. has been incorporated with $20,000 capital by W. S. Martini, W. Windecker and B. Silverman. Forster, Hotaling & Klenke, 50 Wall street, New York, are attorneys.

NEW YORK—Gillen & Harder Brass Foundry has been incorporated with 100 shares no par value by W. Gillen, A. Gillen and H. Harder. J. T. Booth, 233 Broadway, is attorney.

NEW YORK—Revolving Display Machine Co. has been incorporated with 450 shares no par value by N. McL. Sage, H. R. Putnam and W. Duryea. E. W. Pendleton, 25 Broad street, is attorney.

NEW YORK—Everclosed Slip Pin Corp. has been incorporated with $75,000 capital to manufacture pins by L. Hochreiner, E. Hochreiner and G. H. Odenwaller. F. H. Law Jr., 500 West Thirty-fourth street, is attorney.

NEW YORK—Greater City Scrap Iron & Metal Corp. has been incorporated with $50,000 capital by B. A. Cohen, M. Ecker and H. Cooper. P. L. Schick, 1475 Broadway, is attorney.

NEW YORK—Engineering & Parts Co. of New York has been incorporated with $10,000 capital to manufacture automotive parts by F. J. Schlessinger, G. J. Busing and V. Busing. J. A. Garage, 1834 Broadway, is attorney.

NEW YORK—Lethbridge Equipment Corp. has been incorporated with 300 shares no par value to manufacture automatic fire sprinklers by A. E. Lethbridge, G. S. White and J. J. O'Connor. O'Connor & Bain, 43 Cedar street, are attorneys.

NEW YORK—Decker Oxy-Hydro Oil Burner Corp. has been incorporated with $30,000 capital to manufacture oil burning devices by E. T. Kelley, N. Sciano and D. S. Osgood. F. H. Innes, St. George, Staten Island, N. Y., is attorney.

NEW YORK—American H. & V. Products Corp. has been incorporated with $10,000 capital to manufacture heating and ventilating apparatus by J. G. Fruin, and A. E. Magnus. F. P. McGrath, 1475 Broadway, is attorney.

NEW YORK—Economy Metal Products Corp. has been incorporated with $50,000 capital and 1000 shares no par value by T. P. Wilson Jr., K. M. Spencer and H. Hicks. United States Corp., 150 Broadway, is attorney.

NORTH HEMPSTEAD, N. Y.—Can Mfg. Co. has been incorporated with $10,000 capital to manufacture sheet metal containers and similar products by C. A. Meunier, L. Meunier and J. H. Eggers. L. M. Wolf, 110 West Fortieth street, New York, is attorney.

PORT JEFFERSON, N. Y.—Standard Oil Co. of New York, 26 Broadway, New York, will build a 1-story machine shop at Port Jefferson, 40 x 140 feet.

TARRYTOWN, N. Y.—General Motors Corp. has announced that $5,000,000 will be spent on improvements at the Chevrolet plant, work to begin shortly after the new year.

TONAWANDA, N. Y.—Forsyth-Burtch has been incorporated with $600 capital to manufacture electrical appliances by N. H. Forsyth, F. R. Burtch and S. H. Millene. Love & Keating, Buffalo, are attorneys.

WATERTOWN, N. Y.—Ebgesser Electric Mfg. Co. has been incorporated with $50,000 capital to conduct a general machine shop by H. Engesser, F. P. Schuster and L. H. Baldwin. E. F. Carroll, Watertown, N. Y., is attorney.

AMARILLO, TEX.—Phillips Petroleum Co., Bartlesville, Okla., is building new gasoline plant in Panhandle field to be absorption low pressure type handling 16,000,000 feet of gas daily. Engine compressor equipment consists of eleven 165-horsepower engines with motor-driven auxiliary units and six 20-horsepower centrifugal pumps. A. H. Riney is chief engineer in charge of construction.

BRECKENRIDGE, TEX.—Dunigan Tool & Supply Co., manufacturer of oil field tools, has increased capital from $125,000 to $250,000 to provide for plant extensions.

DALLAS, TEX.—Oil & Waterway Pump Mfg. Co., capital $30,000, chartered by C. E. Eubank, 4802 E. Grand street, F. G. Savage and F. L. Martin.

DALLAS, TEX.—American Elevator & Machine Co. has taken out a permit to operate in Texas with Dallas headquarters and J. Peyton Hunter, Wilson building, as state manager.

DALLAS, TEX.—Securbo Lock Bolt & Nut Co., capital $4,000, incorporated by Raymond Smith, 1234 East Georgia street, W. Neil Johnson and Harry Maxson to manufacture automobile lock accessories.

FT. SAM HOUSTON, TEX.—Construction quartermaster, United States army, will receive bids until Jan. 3 for construction of standard steel hangars, 110 x 200 feet and 66 x 144 feet, to have concrete floors and approaches, at Ft. Crockett, Tex.

HOUSTON, TEX.—Texas-Louisiana Power Co. properties at Humble, Tex., have been acquired by Houston Lighting & Power Co. and construction of high voltage lines and transmission stations will connect with the Pasadena plant. S. R. Bertron Jr. is general manager.

HOUSTON, TEX.—Humble Oil & Refining Corp., Humble building, has started construction of a 10-inch screw oil pipe line from its Comyn, Tex., station to its Burnett tank farm in the Panhandle oil field with daily capacity 30,000 barrels. Company is building a 5000-barrel refinery at McCamey, Tex., on the Orient railroad and adjacent to the Upton-Crane county oil field. Ralph Hanrahan is general superintendent in charge of pipe line construction.

SAN ANGELO, TEX.—Orient railroad has moved its repair shop division from Ft. Stockton to McCamey, Tex., adjacent to the Crane-Upton oil field. A new roundhouse and machine shop will be built at McCamey.

SAN ANTONIO, TEX.—Witherspoon Refin-

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports	
Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces	
Foundry and basic 53 to 63 per cent	9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports	
Spanish low phosphorus, 52 to 54 per cent	10.00 to 11.00
North African low phosphorus	9.25 to 9.75
Swedish and Norwegian low phosphorus, 68 per cent	10.25 to 10.75
Swedish foundry or basic, 66 to 68 per cent	9.00 to 9.50
Spanish foundry or basic, 50 to 54 per cent	8.75 to 9.25
North African foundry and basic 50 to 54 per cent	8.50 to 9.50

(All foreign ore prices now nominal)

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum, 47 per cent....36 cents
Indian, minimum 47 per cent....36 to 38 cents
Caucasian, 53 to 55 per cent
Washed .....38 to 40 cents

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, imported duty paid eastern tidewater, per ton	16.75 to 17.50

ing Co., capital 1000 shares no par value, incorporated to build oil refinery by J. B. Jarmon, H. O. Rosenthal and E. M. Corah.

SPOKANE—Siems & Carlson, Realty building, have been awarded contract for a railroad line 13 miles long from Kalispell Bay to the Kalispell creek drainage district, Priest Lake, Idaho, for the Diamond Match Co., to open a timber tract.

MILWAUKEE—Meredith Bros. Co., 253 Washington street, has taken the general contract to build a 2-story addition, 70 x 80 feet, for the Merkle Chevrolet Co. at 789 Thirty-second street, to be used as a service floor and machine shop. Architects Buemming & Guth, 545 Jackson street, Milwaukee, are in charge.

RACINE, WIS.—Ideal Stitcher & Mfg. Co. has been incorporated with $25,000 capitol to manufacture machinery for stitching books, and boxes by F. J. Greene, James M. Easson and C. S. Greene.

SUPERIOR, WIS.—The Peck-Foster Motor Co. has awarded contracts for the erection of a 1-story brick and tile garage and service addition, 100 x 140 feet, costing about $75,000 complete. Roland C. Buck Inc., Superior, is the architect.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$40.00 to 43.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	40.00 to 43.00
Ohio, No. 2	35.00 to 40.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	40.00 to 43.00
Kentucky, No. 2	38.00 to 40.00
Missouri, No. 1	40.00 to 43.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	40.00 to 45.00
Maryland, No. 2	36.00 to 40.00
Georgia and Ala. No. 1	40.00 to 45.00
Georgia and Ala. No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Chicago	52.00
Birmingham	52.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	45.00

Business in Canada

EDMONTON, ALTA.—Maple Leaf Steel Mills Ltd. has been incorporated to take over the business here formerly carried on by the Edmonton Iron Works Ltd., capitalized at $500,000, and intends to increase manufacturing operations. New buildings will be erected, considerable new machinery and tools will be installed, and the company will enter into the manufacture of mining and sawmill machinery, oil well supplies, agricultural implements and general foundry repair business.

HIGH RIVER, ALTA.—E. W. Thornton, Calgary, Alta., has purchased the machine shop and business here formerly operated by Ralph R. Robertson.

EAST KOOTENAY, B. C.—Plans are being prepared by S. J. Atchison, architect, Coristine building, Montreal, Que., for a power plant here to cost $100,000 for the East Kootenay Power Co., Sentinel, B. C.

PRINCE GEORGE, B. C.—According to Hon. T. D. Pattulo, minister of lands, Victoria, B. C., negotiations between the provincial government and F. Jones, representing eastern capitalists, in connection with the establishing of $30,000,000 pulp and paper mills here, have been brought to a successful conclusion. Mr. Jones will leave immediately for the East to complete financial arrangements for the erection of the proposed mills.

WINNIPEG, MAN.—Manitoba Power Co. has been awarded the contract by the Central Manitoba Gold Mines Ltd., to supply 5000 horsepower to their property 55 miles distant over a transmission line of 60,000 volts, work on which has been commenced.

IROQUOIS FALLS, ONT.—Hudson Bay Power Co., Ltd., has been incorporated to generate and supply electricity with a capital of 40,000 shares of no par value by Henry H. Davis, James S. Beatty, Edward H. Brower and others.

OSHAWA, ONT.—Central Spring Co., 133 Ritson Road North, is making progress with an addition to its plant here to cost $15,000. The company will purchase new tools and machinery in connection with addition.

PETROLIA, ONT.—Peninsular Sugar Co. officials have again announced their intention of erecting a manufacturing plant here.

PLENHEIM, ONT.—Local ratepayers will vote on a by-law shortly in connection with the installation of a waterworks plant to cost $85,000.

TORONTO, ONT.—The city council, Thomas Foster chairman, plans the erection of a 30,000,00-gallon electrically operated pumping plant to clear the waters of Ashbridges Bay. Estimated cost $40,000.

TORONTO, ONT.—Canadian Radio Patents Ltd., has been incorporated to manufacture and deal in electrical and radio apparatus, with a capital of 50,000 shares of no par value, by Hedley K. Thompson, John C. McFarlane, Arthur E. Cluffe and others.

TORONTO, Ont.—Fisher Quebec Gold Mines Ltd., has been incorporated to mine, smelt and refine, ores, metals and minerals, with $3,000,000 capital by Winifred C. Carter, Frank W. Day, William A. MacRea and others.

WINDSOR, ONT.—Mayor F. J. Mitchell states that the Essex cities utilities commission is contemplating another unit in connection with new filtration plant here to cost $790,000. It is understood that construction work will be started next year.

MONTREAL, QUE.—Canadian Rhodes Hochrime Mfg. Co. Ltd., has been incorporated to manufacture and deal in machines, machinery, tools, electrical appliances, etc., with capital of 300,000 shares without par value by Henry J. Lawrence, William D. Davis, Daniel O. McNeal and others.

New Trade Publications

CHEMICALS—Roessler & Hasslacher Chemical Co., New York, has issued a pamphlet containing a price list of various chemicals.

TRAMRAILS—Applications of its tramrail systems are shown in several folders issued by the Cleveland Crane & Engineering Co., Wickliffe, O.

NICKEL—The ninth of a series of bulletins on nickel steel recently has been issued by the International Nickel Co., New York. This bulletin presents the physical properties of nickel and nickel-chromium steels.

LATHE TOOLS—A catalog by the McCrosky Tool Corp., Meadville, Pa., covers its line of reamers, chucks and collets, turrets, steadyrests and face plated, with considerable text describing them, illustrations showing their use and data for ordering.

SURFACE CONDENSERS—A bulletin has been issued by the Ingersoll-Rand Co., New York, describing its surface condensers, discussing its operation and efficiency, and fully illustrated to cover the points made. Charts and diagrams add to its completeness.

PORTABLE ELEVATOR—Revolvator Co., Jersey City, N. J., has issued a bulletin illustrating and describing a telescopic model of elevating device which is adjustable to various heights. Details are shown and data for selecting the most suitable.

REFRACTORIES—Refractory brick for hard use, made from diaspore deposits in Missouri, are featured in a bulletin by the A. P. Green Fire Brick Co., Mexico, Mo. Much attention is paid to describing the raw material and its characteristics and the resulting bricks are presented as to their adaptability.

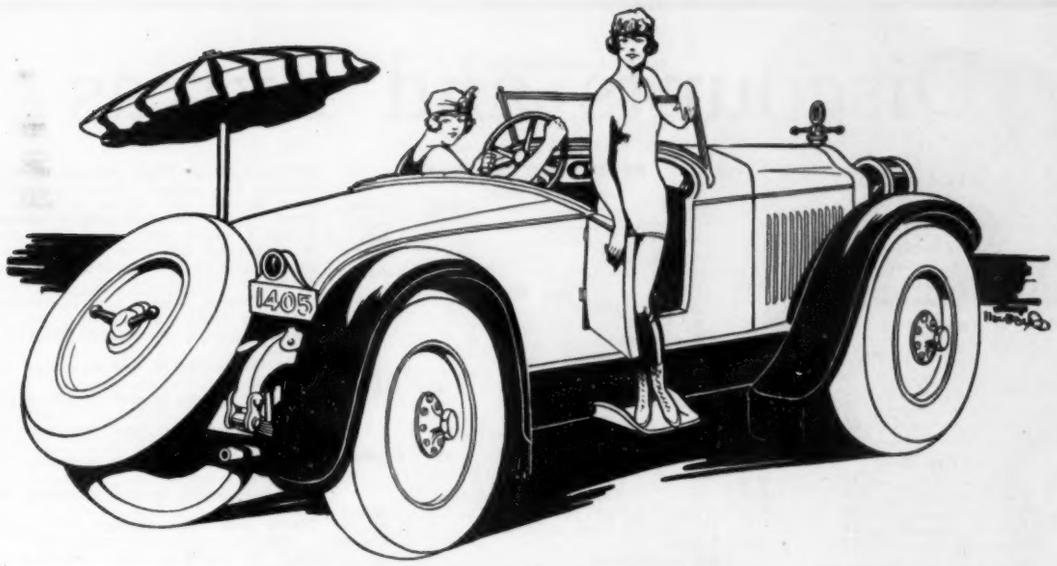
MILLING CUTTERS—Goddard & Goddard Co., Detroit, has issued a catalog of its standard and special milling cutters, containing a number of additions to and revisions of previous issues. The cutters are illustrated and full information is given to guide the buyer in a proper selection.

HEAT INSULATION—General Insulating & Mfg. Co., Alexandria, Ind., has issued a catalog describing a natural calcium silicate rock which is mined by the company and fabricated into insulating material. Characteristics of the insulating material and its application are given.

BLOWERS—A bulletin by the American Blower Co., Detroit, is devoted to its steel plate type. The blower and parts are illustrated and data for selection are included. Another bulletin by the same manufacturer covers its general line with full details and descriptions. Engineering data makes up a large part of this publication.

ELEVATOR SPECIFICATIONS—A general specification on elevators for use of architects has been prepared and is being circulated by the Warner Elevator Mfg. Co., Cincinnati, as a guide in writing specifications for elevators to be installed in their buildings. The specifications cover varied installations of freight and passenger elevators and furnish much information for architects and engineers.

GRAPHIC INSTRUMENTS—A catalog has been issued by the Esterline-Angus Co., Indianapolis, which is something more than a list of its measuring and recording devices. It serves as a guide to determining the requisites of a successful graphic instrument and to selecting the meter best suited to their requirements. The growth of the graphic idea is sketched and the company's organization and aims are presented, followed by a description of the construction and operation of the various devices and suggestions for selection of the proper meter for various uses.



In Florida—or Anywhere

Appearance Counts Mightily

Mansfield Automobile Sheets

MASTER TEC BRAND

The wizards of the automobile motor have perfected power and its dependable delivery to such a high degree that an automobile deficient in this respect would be rare indeed.

To latter-day motor car buyers, power and many other mechanical refinements are taken for granted.

But they are extremely critical of appearance. Appearance counts mightily in clinching the sale. Recognizing this, automobile manufacturers lay particular stress on "finish".

Which brings us to steel sheets—*Mansfield Automobile Sheets!*

The rare excellence of Mansfield Automobile Sheets enables manufacturers to produce remarkably rich finishes of surprising permanence. And of course there's a reason—

The unusual quality of Mansfield Sheets is due to scientific treatment of the metal in the open hearth furnace and the Mansfield distinctive method of pouring the ingots from which they are rolled. Our ingots are low in sulphur and free from "pipes", seams, etc.

Mansfield Automobile Sheets are available to manufacturers in all grades of Body Stock, Flat Fender and Hood Stock, Radiator Casing Stock, Crown Fender Stock.

OTHER SPECIALTIES:

"Wabik Metal" Sheets for Vitreous Enameling, Metal Furniture Sheets, Milk Can Stock, Electrical Sheets, Pickled and Annealed Enameling Stock for Kitchen Utensils. *Sheet Bars and Ingots.*

Mansfield Sheet & Tin Plate Company

Mansfield, Ohio

District Sales Offices:
12-237 General Motors Bldg., Detroit, Mich.
410 Pierce Bldg., St. Louis, Mo.
1106 National City Bldg., New York, N. Y.
2002 Union Trust Bldg., Cleveland, Ohio
1504 West Venango Street, Philadelphia, Pa.
1403 Merchants Bank Bldg., Indianapolis, Ind.

Contributing Member
SHEET STEEL TRADE EXTENSION COMMITTEE

District Sales Offices:
1020 Union Trust Bldg., Cincinnati, Ohio
640 Endicott Bldg., St. Paul, Minn.
237 Rialto Bldg., San Francisco, Calif.
509 Wilcox Bldg., Los Angeles, Calif.
1426 L. C. Smith Bldg., Seattle, Wash.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	45½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	58	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

⅛-inch	42	32½
¼ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	28	7
2½ to 6-inch	26	11
8 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	28 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	36 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	38c
5¾-inch	9-gage	50c
6½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates not Exceeding 72 inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot..... .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

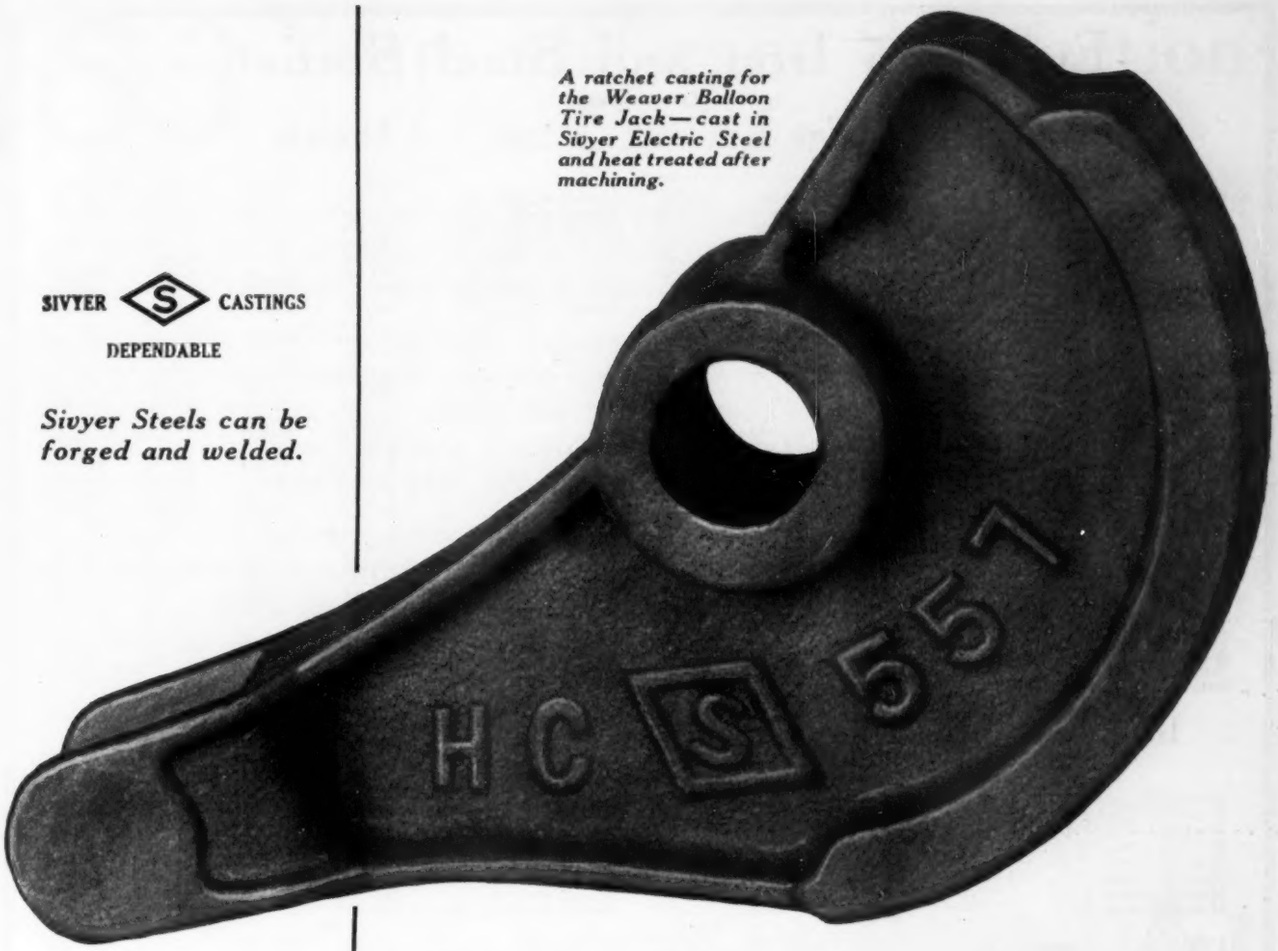
With not more than four straight cuts. (Sketches cannot be sheared wiht re-entrant angles)

Additional extra ..... .20c

SIVYER (S) CASTINGS

DEPENDABLE

Sivyer Steels can be forged and welded.



A ratchet casting for the Weaver Balloon Tire Jack—cast in Sivyer Electric Steel and heat treated after machining.

Where Unfailing Strength and Hardness are Essential

This Weaver Balloon Tire Jack casting has ratchet teeth cut into it. These teeth are called upon to carry directly almost the entire load that the jack lifts—ranging up to and above 5,000 pounds. Obviously, exceptional metal strength and hardness are necessary to prevent the teeth from shearing under excessive loads. Yet, too great a hardness would make machining a costly process. The Weaver Manufacturing Company has solved this problem by using Sivyer Electric Steel—and heat treating the casting after machining. The resulting castings, fully machined and ready for assembly, show a tested scleroscope hardness of from 46 to 49. And the success of the Weaver Balloon Tire Jack testifies to their endurance and unfailing strength in service.

A New Way to Better Parts and Cheaper Machining

The fact that Sivyer Electric Steel Castings can be forged, welded, and heat treated after machining is of vast importance to manufacturers.

It means that a harder steel can be put into the assembly without affecting machining costs. And the heat treatment itself is usually inexpensive and easily handled.

If you'll send blue prints of your parts on which you would like to see service increased—or on which machining costs could be lowered—Sivyer may be able to help you with a heat-treated steel. All recommendations will be made without obligating you in any way.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912..	720,000	405,000	192,000	184,800
Monthly average 1913..	855,000	427,000	203,800	209,000
Monthly average 1919..	617,000	198,000	20,600	50,000
Monthly average 1920..	669,500	281,700	92,700	58,000
Monthly average 1921..	217,600	280,300	71,800	79,600
Monthly average 1922..	403,300	428,900	131,500	137,500
Monthly average 1923..	619,900	437,100	179,100	.....
Monthly average 1924..	607,700	627,900	233,100	.....
1925				
January	574,500	658,900	245,600	197,430
February	541,900	627,000	241,800	176,514
March	607,900	688,871	281,560	198,737
April	569,800	686,130	267,850	.....
May	574,700	695,200	270,500	186,800
June	510,300	692,400	209,400	187,100
July	492,700	712,800	165,800	199,400
August	444,500	701,400	163,400	198,700
September	448,700	705,400	167,600	192,700
October	473,700	727,800	171,500	201,800
November	494,100	728,200	166,100	196,400
December	503,400	736,700	159,000	196,500
1926				
January	533,500	750,900	135,600	200,500
February	502,000	695,500	199,200	182,200
March	568,500	760,300	276,900	209,400
April	539,100	755,800	283,400	193,600
May	88,800	770,400	294,900	191,900
June	41,800	765,800	290,100	207,000
July	17,000	779,200	301,800	208,000
August	13,000	800,800	313,400	206,300
September	12,500	772,800	308,000	.....
October	13,100	.....	.....	.....

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	166,400	16,400	87,000	27,300
Average monthly 1913..	185,900	12,900	68,900	25,000
Average monthly 1919..	42,400	113,100	44,400	.....
Average monthly 1920..	92,400	89,000	67,000	26,200
Average monthly 1921..	137,100	38,500	43,300	.....
Average monthly 1922..	73,500	64,300	42,000	152,300
Average monthly 1923..	110,233	58,700	45,500	144,300
Average monthly 1924..	203,500	570,800	48,400	104,600
1925				
January	234,800	26,500	.....	241,800
February	234,900	16,700	75,100	47,000
March	244,900	15,500	61,200	65,200
April	282,857	16,600	38,900	72,700
May	205,424	11,100	40,300	95,500
June	201,700	11,100	41,600	117,900
July	306,600	19,700	33,000	96,900
August	232,800	14,000	29,600	91,000
September	194,000	17,000	41,900	110,300
October	218,300	13,500	46,200	95,000
November	212,200	12,000	56,000	88,700
December	249,500	11,600	71,400	59,200
1926				
January	221,700	9,400	44,100	61,500
February	228,500	11,700	42,400	62,300
March	258,500	18,400	58,800	62,900
April	261,800	20,000	49,600	77,100
May	166,600	19,900	44,700	.....
June	233,400	17,700	60,200	.....
July	270,000	15,500	46,400	84,400
August	315,100	13,800	43,800	84,300
September	445,700	.....	.....	94,800
October	398,200	.....	.....	.....

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912..	566,000	363,000	206,000	79,400
Monthly average 1913..	639,000	385,000	202,300	109,000
Monthly average 1919..	658,000	179,000	27,400	32,000
Monthly average 1920..	755,600	250,200	101,300	49,000
Monthly average 1921..	302,100	254,500	65,000	62,300
Monthly average 1922..	486,000	372,000	128,200	114,000
Monthly average 1923..	707,400	408,600	194,483	98,250
Monthly average 1924..	677,600	566,600	237,200	.....
1925				
January	605,100	598,600	236,200	170,856
February	652,300	560,100	235,000	157,227
March	684,700	607,076	268,550	178,367
April	597,600	586,977	250,900	.....
May	651,600	587,000	248,800	164,500
June	585,400	570,500	193,600	168,400
July	570,400	615,600	152,700	179,100
August	477,100	607,100	147,000	170,800
September	640,100	621,800	162,000	177,400
October	652,400	657,000	168,600	182,100
November	653,800	637,000	154,000	170,000
December	606,800	648,200	155,500	173,400
1926				
January	640,400	650,200	114,400	171,200
February	703,800	620,500	164,700	167,800
March	784,100	714,300	256,700	192,700
April	661,000	672,600	263,600	177,700
May	45,700	656,700	267,800	167,100
June	34,500	682,000	293,000	187,400
July	32,100	706,000	305,000	188,500
August	52,100	693,400	312,000	1,124,900
September	95,700	695,100	307,600	1,126,300
October	94,200	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912..	400,600	41,500	124,500	482,400
Average monthly 1913..	414,100	48,200	128,800	517,300
Average monthly 1919..	186,100	19,400	14,500	.....
Average monthly 1920..	270,000	74,600	74,300	143,600
Average monthly 1921..	141,700	132,700	75,000	176,000
Average monthly 1922..	283,400	164,000	143,000	209,700
Average monthly 1923..	359,975	173,700	208,466	108,900
Average monthly 1924..	320,200	231,100	285,000	127,600
1925				
January	325,400	270,300	.....	270,600
February	298,800	261,100	527,900	218,600
March	312,200	281,200	285,100	297,000
April	301,027	284,300	267,600	218,000
May	322,140	286,200	283,200	247,300
June	275,700	318,800	275,800	215,100
July	306,600	329,500	256,000	251,400
August	287,800	338,200	195,000	272,000
September	273,200	376,000	277,500	282,700
October	368,800	296,600	225,100	332,500
November	322,200	300,200	257,200	285,600
December	340,800	433,800	286,200	331,600
1926				
January	336,700	345,200	188,200	347,300
February	339,500	353,000	247,300	338,600
March	406,500	355,700	259,700	415,200
April	313,000	350,000	276,000	402,000
May	273,800	323,100	199,700	357,500
June	231,300	297,600	262,000	375,100
July	243,000	306,100	229,200	428,000
August	163,700	323,600	406,000	423,800
September	160,200	316,000	.....	418,700
October	194,100	.....	.....	.....

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Export
1926		
January	79,067	174,585
February	100,213	157,187
March	93,107	169,438
April	107,636	194,449
May	108,731	173,418
June	124,215	159,506
July	82,411	194,717
August	91,578	171,588
September	85,484	182,071
October	81,830	172,070
1925		
January	77,065	141,714
February	92,380	102,302
March	92,110	155,386
April	71,249	155,426
May	68,117	150,612
June	83,330	136,847
July	64,642	138,670
August	68,489	188,963
September	68,445	136,754
October	80,163	141,817
November	79,771	171,134
December	98,400	142,209
Total	943,240	1,762,571

1924		
December	69,281	129,376
November	34,300	124,464
October	40,877	158,553
September	45,216	135,894
August	44,928	136,025
July	30,410	138,845
June	60,474	172,982
May	66,805	168,172
April	50,975	132,739
March	39,279	124,762
February	42,054	168,191
January	26,677	251,284
Total	556,281	1,805,064
1923		
December	27,012	179,215
November	26,534	186,770
October	29,884	154,079
September	36,612	173,664
August	45,432	163,010
July	53,448	170,259
June	68,019	172,747
May	75,891	204,988
April	77,909	179,159
March	106,206	165,624
February	67,707	135,182
January	120,080	124,444
Total	734,734	2,009,141
Yearly Totals		
1922	712,895	2,005,100
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,301	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,011,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	1,103,664
1901	221,297	700,852
1900	209,955	1,154,284

163 Years of Crane Satisfaction
That's One User's Endorsement

Working their cranes most of the time on rapid bucket work but with plenty of hook loads and switching of cars thrown in, this user's Brownhoists show a total of over 163 years of service.

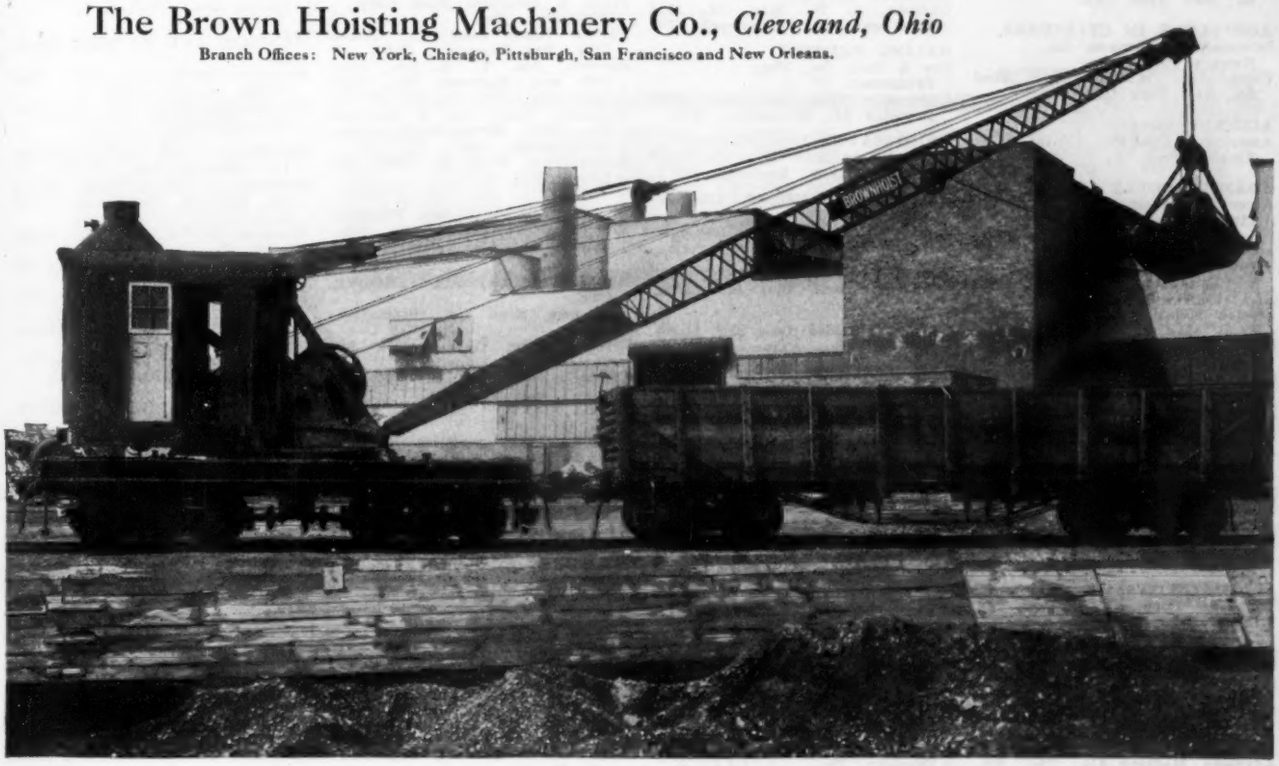
When you consider that these cranes range from 8 to 16 years old and are all still in good working condition, you get an idea of the service users receive from their Brownhoists. Working as a link in a production chain it is of primary importance that a crane stand up and that's what Brownhoists are built to do.

Whatever kind of materials you handle—sand, gravel, stone, coal, iron or scrap—a Brownhoist can effect real savings for you. Maybe a creeper crane will do your work, or perhaps an eight-wheeler will be needed, anyway you can choose from a complete line of Brownhoists. Whenever you're ready we will be glad to help you lick your handling problems.

A modern 25-ton capacity Brownhoist with Brownhoist Clamshell.

The Brown Hoisting Machinery Co., *Cleveland, Ohio*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco and New Orleans.



BROWNHOIST

GOOD MATERIAL HANDLING MACHINERY

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Lagemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Internaitonal Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

ALUMINUM (Vanadium)
Vanadium Corp., of America, 120 Broadway, New York City.

ALUMINUM TUBING
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Adamson Machine Co., The, Akron, Ohio.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Zanesville Malleable Co., Zanesville, O.

ANTIGLARE PREPARATION
Skybryte Co., The, Keith Bldg., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Cox & Sons Co., The, Bridgeport, N. J.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BAND SAWS (Metal Cutting)
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARS (Alloy)
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Truscon Steel Co., Youngstown, O.

BARS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Republic Iron & Steel Co., Youngstown, O.
Truscon Steel Co., Youngstown, O.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St. Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
Hoover Steel Ball Co., Ann Arbor, Mich.
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Hyatt Roller Bearing Co., Newark, N. J.
Keystone Bronze Co., 39th St., Pittsburgh, Pa.

BEARINGS (Motor)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Timken Roller Bearings Co., The, Canton, O.

BEARINGS (Thrust)
Hoover Steel Ball Co., Ann Arbor, Mich.
Norma-Hoffman Bearings Corp., Stamford ,Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1308 Elston Ave., Chicago, Ill.

BELTING (Chain)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

BELTING (Leather)
Chicago Rawhide Mfg. Co., 1308 Elston Ave., Chicago, Ill.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BILLETS (Tool Steel)
Union Electric Steel Corp., Frick Bldg., Pittsburgh, Pa.

BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below